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The Agricultural Gazette of Canada

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CONTENTS

	PAGE
The Future of the Live Stock Industry.	5
Potato Trade with the United States Re-established	6

PART I

THE DOMINION DEPARTMENT OF AGRICULTURE.

The Dominion Experimental Farms:-	
The Division of Chemistry: -	
Bacterized Peat or Humogen, by Frank T. Shutt. ..	10
The Division of Horticulture:-	
Experiments in Growing Vegetable Seeds in 1915, by W. T. Macoun.	11
The Dairy and Cold Storage Branch:-	
Maturity of Fruits for Precooled Shipments, by Edwin Smith .	18
The Entomological Branch:	
The Introduction and Establishment in Canada of the Natural Enemies of the Brown-tail and Gipsy Moths, by C. Gordon Hewitt.	20
Rearing the Parasites of the Brown-tail Moth in New England for Colonization in Canada, by Leonard S. McLaine	22
The Fruit Branch:	
The Fruit Crop of 1915, by D. Johnson	26
The International Institute Branch:	
The International Institute of Agriculture and the War, by T. K. Doherty	27
The Live Stock Branch -	
The Marketing Problem.	28
The Seed Branch:	
Field Root and Vegetable Seed, by Geo. H. Clark	30
The Health of Animals Branch:-	
The Animal Contagious Diseases Act Amended..	32

PART II

PROVINCIAL DEPARTMENTS OF AGRICULTURE.

Crop Production in 1915:	
Prince Edward Island, by Theodore Ross..	33
Nova Scotia, by M. Cumming	33
New Brunswick, by J. B. Daggett	35
Ontario, by W. Bert Roadhouse.	35
Manitoba, by A. J. McMillan.	37
Saskatchewan, by F. H. Auld	39
Alberta, by Chas. S. Hotchkiss..	40
British Columbia, by A. B. Tweddle	42
Ontario: -	
Notes from District Representatives, supplied by C. F. Bailey	43
District Representative Leaflet.	45
Inter-County Live Stock Judging Competition, by C. F. Bailey...	45
The Dairy School, Ontario Agricultural College, by H. H. Dean.. . . .	47
The Eastern Ontario Dairy School, Kingston, Ontario, by L. A. Zufelt.. .	50

Quebec:—	PAGE
Apple Box Competition at Oka Agricultural Institute.	55
The Dairy Herd at Ste. Anne de la Pocatière, by Professor Pasquet.	56
Saskatchewan:—	
Farm Boys' Camp.	57
British Columbia:—	
Registered Seed Distribution.	58

PART III

RURAL SCIENCE

Elementary Agricultural Instruction: -	
Prince Edward Island, by W. R. Reek	60
Nova Scotia, by L. A. DeWolfe	63
New Brunswick, by R. P. Steeves	65
Rural School Department of Macdonald College, by J. Egbert McQuat	67
Manitoba, by H. W. Watson.	68
Saskatchewan, compiled by A. W. Cocks	70
Alberta, by J. C. Miller	73
British Columbia, by J. W. Gibson	74
School Fairs: --	
Nova Scotia, by L. A. DeWolfe	77
Quebec, Reports from Different Counties	79
Ontario, by C. F. Bailey..	81
Manitoba, by H. W. Watson	84
Saskatchewan.	85
Alberta, by J. C. Miller	87
British Columbia, by J. W. Gibson	88

PART IV

SPECIAL CONTRIBUTIONS, REPORTS OF AGRICULTURAL ORGANIZATIONS, NOTES AND PUBLICATIONS

A Rural Fair in City Limits	89
The Economic and Development Commission	92
Bank Assistance to Agriculture	92
A Beef Demonstration	93
Co-operative Selling	93
Objects of the Short Course.	94
The Crop in the Prairie Provinces	94
Three Day Dairy Tests	95
Societies and Associations	96
New Publications.	100
Book Reviews.	102
Notes.	103
Index to Periodical Literature.	104

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OF CANADA

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THE FUTURE OF THE LIVE STOCK INDUSTRY

I believe that every gentleman here who is interested in agriculture will agree with me that the outlook for the live stock industry is bright and that the opportunity for starting in live stock breeding was never so propitious as at the present time. . . .

My advice to those who have money, and most of the farmers have this year, would be that they could not pursue a saner or wiser policy than to go into live stock raising on a larger scale than ever before. . . .

Investigation has shown that this is the first year for many years that production has begun to keep pace with consumption. The day has come when we are no longer dependent on the larger importations that we have been accustomed to in the past. . . .

There is the recognition of the fact that upon Australia and the Argentine and the other countries of the world has come a big strain which has had its effect on their live stock industry. Upon Europe ravaging war has brought wholesale depletion affording Canada, with its broad acres and men of brain and muscle, the opportunity to develop the industry that should in the next few years occupy an enviable position. . . .

-The Honourable Martin Burrell at the Ontario Winter Fair.

POTATO TRADE WITH THE UNITED STATES RE-ESTABLISHED

THE long standing difficulties connected with the potato trade with the United States have recently been overcome as a result of personal negotiations between the Minister of Agriculture and the Washington authorities. Without going into a detailed history of the matter it may be recalled that in December, 1913, the United States prohibited the admission into that country of potatoes from amongst other countries—the Dominion of Canada, owing to the existence of the disease known as powdery scab "*Spongospora Subterranea*." About the same time the United States also placed the states of Maine and New York under quarantine owing to the prevalence of the same disease. Negotiations were then entered into with a view of ascertaining under what terms Canadian potatoes might get into the United States market. As a result, and in order to meet the requirements of the United States authorities, regulations were promulgated by the Canadian Government which called for an elaborate system of certification and inspection, both in regard to exported potatoes and potatoes moved from one province to another. The regulations proved to be both cumbersome and highly expensive to administer, and the subsequent discovery of a few potatoes affected with powdery scab in a consignment to the United States led to the replacing of the embargo against this country. Investigational work was constantly carried on by the officers of the Department and the Department became convinced that the disease in question was not so serious as to warrant the drastic action which had been taken and it became apparent that the United

States authorities had come round to somewhat similar views inasmuch as on the first of September, 1915, they removed and revoked the quarantine placed on Maine and New York and permitted the movement of potatoes to other states without restriction notwithstanding that the disease still existed in the said two states. After a careful review of the whole situation the Minister of Agriculture recommended to the Government that the regulations referred to should be abolished and this action was accordingly taken by the Government on the 8th of October, 1915.

Having in view the action taken by both countries it was hoped that the United States would now permit free entry of Canadian potatoes, but after taking the matter up with the Department at Washington it was found that they had come to no decision in regard to foreign countries and were inclined to fall back in regard to Canada on their general regulations of December, 1913, which would still mean that quite an elaborate system of inspection and certification would still be required on Canada's part before potatoes could be exported to the United States.

In the belief that personal negotiations might result in some favourable arrangement, the Honourable Martin Burrell visited Washington at the end of October and discussed the whole matter exhaustively with the Hon. David F. Houston, Secretary of Agriculture, Mr. C. L. Marlatt, Chairman of the Federal Horticultural Board and Dr. W. A. Orton, the expert of the Department. The Minister was met with the greatest friendliness and courtesy and found

that, while the United States authorities frankly admitted that powdery scab was not so highly dangerous as at first thought, they were anxious to safeguard their own country from the spread of potato disease generally and were perfectly willing to consider the framing of regulations which would do this and at the same time create no unnecessary hardship on the trade.

As a result of the Minister's visit and subsequent negotiations by correspondence with Mr. Marlatt a satisfactory adjustment of the difficulties has been arrived at. It was suggested that in the case of Canada potatoes could be exported to the United States on the assurance of this Government that such potatoes would be free from injurious diseases and insect pests. This phrasing applies to exceptionally dangerous diseases such as potato wart or canker and Mr. Marlatt in a letter of November 12th stated:

"It is understood that the words 'injurious diseases and insect pests' shall not apply to diseases common and widespread in both Canada and the United States, but that in the case of even such common and widespread diseases the stock offered for shipment shall be reasonably free from infection with such disease. In other words, as a specific example, shipments of potatoes badly infected with common scab or with powdery scab or with other diseases also occurring in both countries, may be refused entry, and considerable and repeated offerings for entry of such badly infected lots may lead to further restrictions or even refusal of further entry."

Mr. Marlatt also indicates that instead of the examination and certification of potatoes which was formerly required they would be willing to accept a general agreement from the Dominion Government to authorize for export to the United States only such potatoes as are free from injurious diseases and insect pests. The Minister of Agriculture in replying assented to the reasonableness of this view, and further suggested that it might be desirable

that the United States would also give a similar assurance in regard to the character of their own potatoes for export, and trusted that the ports of entry would not be unduly limited, and expressed himself as of the belief that a broad and fair working out of such an arrangement would provide a satisfactory solution of the whole question and tend to preserve both countries from the spread of undesirable pests and diseases. In his final letter of December 6th Mr. Marlatt wrote:

"In the matter of ports of entry, the form of application for the permit enables the importer to indicate the port of entry, and it is our expectation to put practically no limitation on ports of entry. Naturally, most of the potatoes will enter through a limited number of ports, where it will be perfectly practicable for us to examine regularly the potatoes offered for entry. In the case of other ports, such occasional examination will be made as conditions seem to justify.

"As to the movement of American-grown potatoes to Canada this Department can issue notification to our growers and exporters to the effect that the continuation of their trade with Canada will be conditioned on their offering for shipment to Canada potatoes free from injurious diseases and insect pests. It is understood on both sides that the continuation of the reciprocal trade in potatoes is in the hands of the persons engaged in this trade, and that an honest effort on their part to send clean potatoes will be recognized and the trade will continue without restrictions under such conditions, but that such trade may be jeopardized by repeated carelessness in offering for entry badly diseased or infected with insect pests

"The new regulations will become effective January 1st, next, and we will be ready to issue permits for the importation of Canadian potatoes as soon after that date as we are notified that the action proposed in your letter has been taken."

This briefly constitutes the terms of the arrangement, and it is much to be hoped that the growers and exporters in both countries will live up to the letter and spirit of the agreement and thus enable the trade between the two countries to be carried on without any unnecessary difficulties.

Appended is the circular which has been issued and extracts from the regulations of the United States, revised December 8th, and effective January 1st.

SHIPMENT OF POTATOES TO UNITED STATES

On and after 1st January, 1916, Potatoes may be shipped from Canada to the United States, subject to the following conditions:—

- (1) POTATOES OFFERED FOR EXPORT TO THE UNITED STATES MUST BE FREE FROM INJURIOUS DISEASES AND INSECT PESTS.

("Injurious diseases and insect pests" shall not apply to diseases common and wide-spread in both Canada and the United States, but in the case of even such common and wide-spread diseases the stock offered for shipment shall be reasonably free from infection with such diseases.)

- (2) No shipment may be made until a permit has been issued to the United States importer as provided for in the United States regulations. Each shipment should therefore be designated on the accompanying papers by the permit number which will be furnished by the United States importer.

Inspection will be made by a United States Inspector at the port of entry specified in the permit, and if the shipment be found to be diseased, entry may be refused.

- (3) No inspection or certification will be required prior to shipment, but potato growers and shippers are advised that the continuation of such entry will depend on the offering for entry into the United States of potatoes free from dangerous diseases and insect pests.

All persons engaged in this trade should have their potatoes carefully "racked," and any diseased or scabby potatoes removed.

For further information, apply to the Dominion Botanist, Central Experimental Farm, Ottawa.

EXTRACTS FROM UNITED STATES REGULATIONS

That in the case of foreign countries contiguous to the United States the examination and certification of potatoes offered for export will be waived when such country shall agree to offer for export to the United States only potatoes free from injurious diseases and insect pests.

No shipment of potatoes will be permitted entry until it has been examined by an inspector of the Department of Agriculture and found or believed to be free from the potato wart and other injurious potato diseases and insect pests.

Persons contemplating the importation of potatoes shall first make application to the Federal Horticultural Board, Department of Agriculture, Washington, D.C., for a permit, stating in the application the name and address of the exporter, the country and locality where grown, the port of departure (or port of consular invoice), the proposed port of entry, and the name and address of the importer in the United States to whom the permit should be sent.

Applications for permits must be made in advance of the shipment of the potatoes.

Applications may be made by telegraph, in which case the information required above must be given.

Permits are not required for potatoes entering the United States for immediate transportation in bond to foreign countries.

On approval by the Secretary of Agriculture of an application for the importation of potatoes a permit will be issued in quadruplicate. One copy of the permit will be furnished to the applicant, to be retained by him for presentation on the arrival of the imported potatoes to the customs officer at the port of entry named in the permit, one copy will be mailed to the collector at the port of entry, one to the inspector of the Department of Agriculture, and the fourth filed with the application. The beginning of the period for which a permit will be valid will be expressed in the permit. All permits will expire on the 30th day of June next after they become valid.

"In the past nine years the grain growers of Manitoba, Saskatchewan and Alberta have organized three companies for the handling of their grain. These three companies are now operating 490 country elevators and one large terminal elevator at the head of the great lakes. The total assets of these three farmers' companies are over four and a half million dollars and a paid up capital of one and one-half million dollars. During their operations the farmers have handled through their own companies over 250,000,000 bushels of grain and have made a net profit on their operations of over \$1,600,000. This, in brief, is the record of the three western farmers' grain companies, the Grain Growers' Grain Company, Winnipeg; the Saskatchewan Co-operative Elevator Company, Regina, Saskatchewan, and the Alberta Farmers' Co-operative Elevator Company, Calgary, Alta.

"In 1906 they established the Grain Growers' Grain Company as a commission house, which has since developed into track buying and the operation of 175 elevators in Manitoba and 2,500,000-bushel terminal elevators at Fort William. In 1911 the farmers of Saskatchewan organized the Saskatchewan Co-operative Elevator Company, in which the Government assisted to the extent of 85 per cent of the money required. In 1913 the farmers of Alberta organized the Alberta Farmers' Co-operative Elevator Company on the same lines as the Saskatchewan Company and with the same assistance from the provincial government. All of these companies have been successful, and as a result of their operations they have removed a very large portion of the grievances of the grain trade." *George F. Chipman, at the National Conference on Marketing and Farm Credits.*

I, too, acknowledge the all but omnipotence of early culture and nurture; hereby we have either a doddered dwarf bush, or a high-towering, wide-shadowing tree; either a sick yellow cabbage or an edible luxuriant green one. Of a truth it is the duty of all men, especially of all philosophers, to note down with accuracy the characteristic circumstances of their education--what furthered, what hindered, what in any way modified it.—*Carlyle.*

PART I

Dominion Department of Agriculture

INFORMATION SUPPLIED BY OFFICIALS OF THE VARIOUS
BRANCHES REPRESENTED

THE DOMINION EXPERIMENTAL FARMS

THE DIVISION OF CHEMISTRY

BACTERIZED PEAT OR HUMOGEN

BY FRANK T. SHUTT, M.A., D.Sc., DOMINION CHEMIST

IN the issue of THE AGRICULTURAL GAZETTE for March, 1914, the writer gave an account of Bacterized Peat or Humogen, for which much was being claimed as a manurial product of extraordinary merits and value. Its "discovery" had been announced as the result of researches carried on with peat in the domain of bacteriology over a period of years by Professor W. B. Bottomley of King's College, London, England. In that article the preparation of the product was outlined, its claims discussed and the possibilities of its usefulness in practical agriculture considered.

During the past two months public interest in this material has been again revived by notices in the agricultural and daily press of England and Canada, many of which have set forth in glowing terms certain extraordinary results that have followed its experimental use. In consequence of this wide publicity numerous enquiries as to the real merits of this "wonderful manure" have been received by the Division of Chemistry and it seems therefore desirable to again state, as clearly

as the condition of our knowledge permits, the main facts regarding the nature of this product.

THE METHOD OF PREPARATION

Briefly, the peat is treated or inoculated with certain bacteria, which have the effect of increasing the amount of soluble humates in the peat. The peat is then sterilized and again inoculated, but this time with nitrogen-fixing organisms. This is stated to greatly increase the soluble nitrogenous compounds of the peat and it was to these that, at first, the fertilizing value of the product was attributed. More recently, Professor Bottomley has considered that other and as yet unknown substances are produced in the peat by the treatment and that to these so called "accessory food substances" the manurial value is largely due. So far as we are aware, the details of the preparation of bacterized peat have not been made public. Neither do we know anything as to the cost of its manufacture. It is not yet upon the market, nor is it generally obtainable.

EXPERIMENTS IN ENGLAND

We learn that a number of experiments have been made during the past two seasons in England, to ascertain the manurial value of Humogen (the latest name for this bacterized product) but that these have been chiefly carried on in pots in the greenhouse or on very small plots. While in certain of these the results have been inconclusive or negative, others have shown an extraordinary increase in growth, due apparently to the application of the preparation. It is these latter results, which must be regarded as phenomenal, that have given rise to the assuredly exaggerated claims for Humogen as a fertilizer. Mention has been made of a few experiments conducted on a larger scale and these we understand have not been at all encouraging in their results. Their details, however have not been published.

INCONCLUSIVE RESULTS

If we were to admit as conclusive certain of the remarkable results obtained in these preliminary experiments, which as we have said have been chiefly obtained in pots and in the greenhouse, it would have to be admitted that Professor Bottomley

had made a most valuable discovery. But we cannot regard them as conclusive. These results must be confirmed on a larger scale, in the field, by independent workers, before we can be assured as to the practical value of this material to the farmer and gardener.

We find ourselves therefore at the present time unable to make any pronouncement as to the exact fertilizing value of this preparation. The whole matter is still under investigation and final judgment must be withheld until we are in possession of further data. Astounding increases have been reported, but even if these have been due directly to Humogen, it must be remembered that they have not been obtained under ordinary farming conditions. We are under the impression that many of the claims for Humogen are extravagant and will not be substantiated by further investigation, but there are possibilities, as was pointed out in our previous article that we may have in this material a valuable addition to our nitrogen and humus furnishing manures and a preparation that can enact a special rôle in soil inoculation or in stimulating the activities of useful bacteria in the soil.

THE DIVISION OF HORTICULTURE

EXPERIMENTS IN GROWING VEGETABLE SEEDS IN 1915

BY W. T. MACOUN, DOMINION HORTICULTURIST

THERE is no doubt but that ever since the first settlements were established in Canada about three hundred years ago vegetable seeds have been saved from home grown plants and there are now many Canadians who grow their own corn, tomato, melon, bean, and pea seed as well as other kinds; but comparatively few are growing celery, beet, cabbage, cauliflower and onion seed, as the seed of these vegetables is not so easily grown.

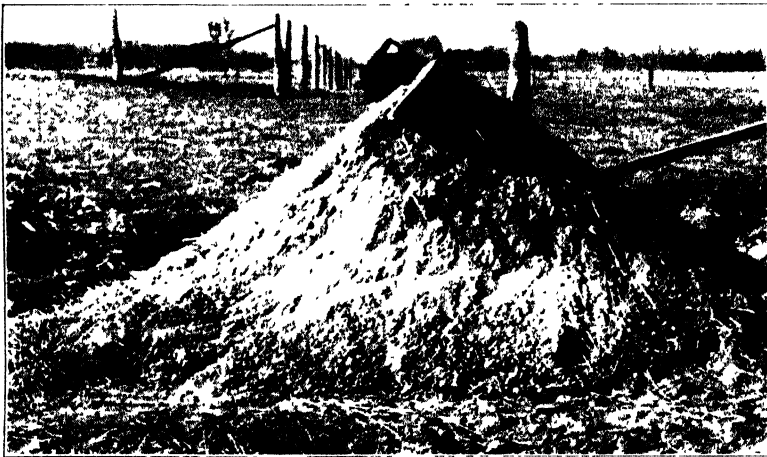
The commercial production of vegetable seeds is limited to a very few persons in Canada and the kinds of vegetable seeds grown commercially are few in number.

After the war broke out it was realized by the Government that there might before long be a decided shortage of those seeds of which France and Germany furnished a large proportion, and the time seemed opportune for encouraging Canadians to grow more seed them-

selves. A bulletin on "Growing Field Root, Vegetable and Flower Seeds" (Bulletin No. 22, Second Series) was, therefore, published by M. O. Malte, Ph. D., and the writer, in which information was given on the growing of certain kinds of seeds. Experiments were also begun on the Central Farm and on a number of the branch farms and stations in growing seed of some vegetables not usually grown by Canadians. The experiments at the Central Farm were under the charge of Mr. M. B. Davis, B.S.A., and following is a report by him of the results obtained.

improvements have been made this present season and a description may be of value.

A hole about two feet in depth, and as large as was needed, was excavated on a sloping piece of ground. Carrots and beets were placed in rows in this pit and covered with soil. Cabbages were also heeled in along side the roots, being buried in soil up to the head, in a single layer or tier, and celery in a like manner, the latter being almost completely buried in soil till only the tips showed. Both cabbage and celery were placed in nearly upright positions. Over these vegetables a heavy layer of dry straw



TYPE OF PIT USED FOR PITTING SEED ROOTS OVER WINTER, CENTRAL EXPERIMENTAL FARM

STORING THE ROOTS

As most of our popular vegetables are biennial plants, that is, require two years in which to produce seed, it is necessary in this climate to resort to some means of holding the yearling plants over the winter. Last year at the Central Farm, beets, carrots, cabbage and celery were successfully carried through the winter season by storing in pits in the open, while onions were carried through in a root cellar.

Although the method of pitting adopted was probably not the best,

was placed, then a covering of boards followed by tar paper and about one foot of earth. This was hardly sufficient covering to keep out frost, but most of the plants thus stored grew and produced seed.

Beets and carrots all came through without being injured at all and with very little loss due to rot. Some of the roots had started growth when taken from the pit and others were perfectly dormant. It was observed during the summer that the perfectly dormant ones, in every case, did better than those which started growth.

Cabbage also was free from rot and injury in most cases. Many of the heads, however, had put forth considerable growth, which proved injurious before the season was over, as the top grew too fast before the roots had obtained a sufficient hold to properly supply them with food and moisture, the result being that when dry weather came they all drooped and died.

The celery in nearly every case was all gone with rot, excepting the heart, and was a sorry looking mess when planted, but despite this a better stand of celery was obtained than

and will afford a better protection against freezing.

SELECTION OF THE SEED STOCK

In order to obtain the best seed, seed which will produce first class vegetables, it is essential that careful attention be paid to the selection of the vegetables the previous year to their bearing seed. Type is very important, and the grower must be acquainted with the varieties he is attempting to grow, in order that he may have a fixed type in his mind at harvest time.



PIT FOR STORING SEED ROOTS, IN COURSE OF CONSTRUCTION, CENTRAL EXPERIMENTAL FARM

of any other crop. One variety "Winter Queen", did not lose a single plant out of seventy-eight planted.

Onions of course were all in good condition, so that there is nothing special in this instance to be reported.

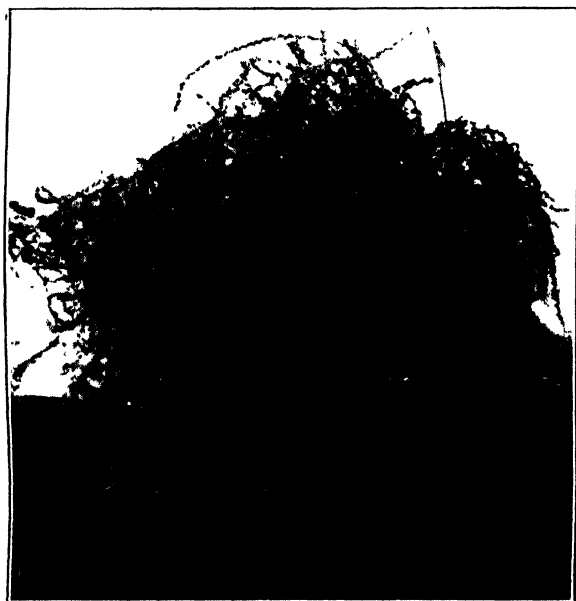
This season the roots have been pitted by themselves in a pit conillustration on page 12 while the structured as that shown in the cabbage and celery have been pitted in a similar manner to last year, with the exception that a ventilation shaft has been provided and alternate layers of straw and earth take the place of tar paper and boards,

From experience gained this past season, the following recommendations are made:

Beets:—In harvesting beets for seed purposes they should, first of all, be pulled by hand, tops and all, then those roots which are full sized and true to type, selected and placed to one side, after which they may be topped, taking care not to cut too close to the crown buds, from which will start the seed bearing stocks of the following year. The roots of the beet should be left intact and not trimmed, as for table use. When thoroughly dry they may be

hauled to the pits and piled in position for storage, or, if desired, they can be handled in bags, which is, perhaps, the more desirable method of storing them, especially in small quantities.

Carrots:—Carrots are handled similar to beets, care being necessary to select only the roots that are true to type. If small or immature roots are selected the progeny will soon be of an inferior class.



BET PLANTS IN SEED, CENTRAL EXPERIMENTAL FARM

Cabbage:—Cabbage should be pulled root and all, and the outside leaves removed. Care is necessary in handling, to avoid the breaking of the long tap-root.

Celery:—Celery should be lifted with the roots left on, and may be immediately heeled in a shallow pit, care being taken to remove any diseased stocks and also to throw out any heads that are not true to type.

Onions:—In selecting onions for seed too much care cannot be given

to type. Do not use any that show signs of producing big necks, or thick-necked onions. It would seem that vegetable growers could do much to improve their onion crop by growing their own seed with a rigid system of selection. All growers know how much a good crop of onions depends upon the source of the seed, probably more so than any other vegetable grown.

PLANTING

The land to be used for seed production was thoroughly ploughed in the spring and heavily manured, and the plants set out as soon as possible in early spring. The distances recommended in the different varieties are as follows:

Cabbage, carrots and beets should be planted in rows 36 inches apart, with the plants two feet apart in the row. This may seem rather close, but if placed too far apart the plants are apt to lie down when loaded with seed, whereas if they are fairly close together each will support the other to a large extent. In the case of celery the rows should be the same distance apart but the plants only one foot apart

in the rows, while onions are placed only 6 inches apart in rows 30 inches apart.

Constant cultivation is necessary at the beginning of the season especially, but in the case of a slow maturing seed like celery, cultivation may be discontinued in late summer to hasten the maturity of the seed.

HARVESTING AND CLEANING

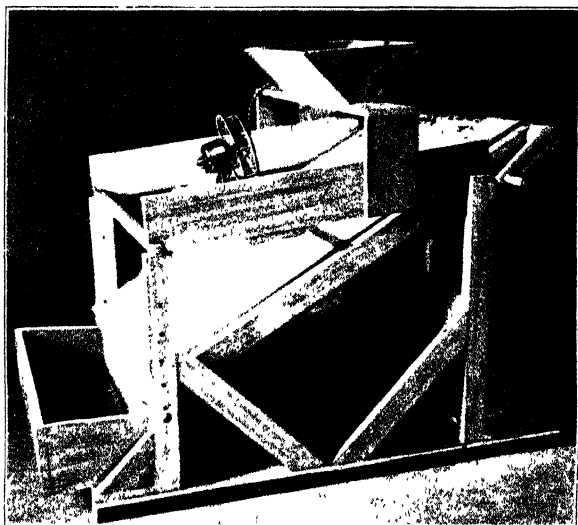
The different vegetables require different methods of harvesting, each one being a problem in itself. Probably the simplest crop to handle

is that of beet, this vegetable ripening its seed nearly all at once. In harvesting beet seed it is only necessary to remember to cut it in the green stage just as it is commencing to turn brown. In order not to jar the plant any more than is necessary it should be cut with a sharp spade just at the ground, thus removing the top part of the roots with the stalks attached. The man cutting may be followed by another who ties the cut seed stalks into bundles, he again is followed by a man with a spade who cuts off the attached piece of root, thus leaving the stalks tied in bundles ready for stooking. The stooks should not remain in the field many days before they are threshed, as it is considered better to thresh them slightly in the green stage and allow the seed to ripen after threshing. If only small lots are being handled, a flail will serve for threshing, if large lots, an ordinary threshing machine serves admirably.

The seed may be fairly well cleaned by an ordinary fanning mill, but this will not take all sticks, etc., out, although grading the seed fairly well. To remove the sticks the seed is put over a revolving endless belt which is on a steep incline, the seed rolling down the belt to a box, while the sticks and dirt are carried on over the other end. By using the electric fan the dust and light seed are blown out before they strike the belt, thus giving a nice clean sample of seed. The apparatus illustrated on this page is one that can be readily made by any person who is at all handy with tools and serves excellently for fairly large lots of seed.

Carrots: - Carrot seed is not as easily harvested as beet seed. Several pickings are necessary in the case of carrots, as the heads all ripen at

different intervals extending over a long period. The ripened heads may be clipped off from time to time when necessary and gathered in baskets and stored awaiting threshing. The threshing and cleaning of carrot seed are much more difficult tasks than handling beet seed. In order to separate all the seed and to have all the fine hairs from the edges broken off, it should be thoroughly dry and ripe before threshing and should only be threshed on a cool dry day. Probably two threshings will be necessary to obtain well



HOME MADE MACHINE FOR CLEANING VEGETABLE SEEDS. CENTRAL EXPERIMENTAL FARM

rubbed seed. If small lots are being handled the seed may be separated in a bag by beating with a stick. The ordinary fanning mill will clean and grade with the exception of removing the sticks which it seems impossible to get rid of with ordinary fanning mills and separators.

Celery: - Although celery seed does not all ripen together, there being blossoms still unopened at harvest time, last year's experience goes to demonstrate that it may be successfully cut on the slightly green side before a great deal of the early seed



CELERY PLANTS IN SEED, CENTRAL EXPERIMENTAL FARM

has matured sufficiently to drop off. This appears to be a more practical way of handling than by making several cuttings, for in the case of celery it is tedious and expensive work to gather small lots of seed as it ripens. Of course it will probably be necessary to go over the plants once to get the real early seed if one wishes to save it, otherwise it will shell before the plant has sufficiently matured the major part of its crop. When cut, the heads, or stalks, as the case may be, should be handled carefully and, if possible, should be handled on sheets, for celery seed, when dead ripe, and there will always be a portion in that stage, shells very easily. As celery seed is expensive a grower could afford to give special attention to these details. When cut green, the stalks should be placed in a drying shed to dry before shelling. The shelling is more difficult than with most seeds for there is always a considerable portion which will adhere to the heads unless rubbed quite firmly. This no doubt is the fairly green seed which when ripened inside does not shell as easily as when ripened in open air.

An experiment in which equal quantities of Winter Queen celery

were cut on the green side and allowed to ripen in the field, and gathered at intervals, gave results in favour of cutting green. The green cut plants gave a yield of 2 pounds $7\frac{1}{2}$ ounces of No. 1 seed from 34 plants, while that cut ripe gave a yield of 1 pound $14\frac{1}{2}$ ounces from 34 plants. The ripe seed gave a fifteen day germination test of 72 per cent, while the green cut plants gave a yield of 93 per cent in the same time.

The seed after being separated from the stalks was put through a Clipper fanning mill, which did excellent work in cleaning the seed.

Cabbage:— From evidence obtained this past season, cabbage plants which are perfectly dormant, do much better in the long run than those which have thrown up a seed stalk while in the pit, the former appearing to be more thrifty and yielding larger quantities of seed. Cabbage plants, like most of the other vegetables, are a puzzle when to cut.



CABBAGE PLANT IN SEED, CENTRAL EXPERIMENTAL FARM

The early bloom is ripe before the mid-summer bloom has set seed, so that no matter how the grower works it there is always an apparent loss at harvest time. At the Central Farm this year the plan of cutting off the earliest pods was adopted, while the later ones were left until harvest time when the whole plant was harvested as soon as the majority of the seed pods had commenced to turn yellow. The seed in a cabbage pod commences to darken and harden before the pod dries up, so that if cut at the stage mentioned above the bulk of the seed will mature in the pod and the loss due to shelling will be greatly reduced. The cabbage seed may be threshed by flail or by machine and a Clipper mill will do excellent work at cleaning it as will also the machine shown on Page 15.

Onions:- Onion seed, even if the whole field does not ripen together, which, however, it generally does, is easily gathered head by head. If thoroughly ripe it can be shelled by light threshing, and with a fanning mill and low wind can be readily



SEED PLOTS OF ONIONS AND BEETS, CENTRAL EXPERIMENTAL FARM

cleaned. The onion seed plot at the Farm this year was not a fair test as many varieties were grown and in order to keep them pure the heads were put in paper bags, thus undoubtedly reducing the yield.

YIELDS

Below will be found the average yield per plant of some of the different varieties of vegetables, together with a germination test in most cases. At the time of writing the germination test is not completed so in nearly every instance the germination will be higher than is recorded here.

YIELDS OF SEED FROM DIFFERENT VEGETABLE PLANTS, CENTRAL EXPERIMENTAL FARM, 1915

VEGETABLE	Maximum Yield per Plant	Average Yield per Plant	Lowest Yield per Plant	Germination
Beet	12 oz.	5 6 oz.	1 3 oz.	88-97
Carrot		2 5 "		85
Celery (green)		1 18 "		93
Celery (ripe)		1 "		72
Cabbage	2 25 oz.	2 "	1 75 oz.	90-100

The following number of plants of each kind of vegetable was grown by the Horticultural Division in 1915. A note regarding the total amount of seed grown is also appended. It must be remembered that many of

the varieties were grown under cotton covers to keep them from crossing and that this materially reduces the yield. The average yields per plant referred to in the above table were computed from plants that were not cov-

ered and hence will not compare with those here referred to, which are total yields of covered and uncovered.

The piece of land used for growing these seeds was 100 x 40 feet in dimensions.

NUMBER OF PLANTS AND WEIGHT OF SEED, PRODUCED AT CENTRAL EXPERIMENTAL FARM, 1915

VARIETY	Number of Plants	Weight of Seed		Approximate Retail Value
		lb.	oz.	
Cabbage	66	2	9	\$ 5 20
Celery	186	9	9	43 87
Carrot	176	9	12	16 06
Beet	113	40	9	50 00
				\$115 13

Equal to \$1,253.76 per acre.

The above estimate of value is based on the retail price per pound of the different kinds of seed.

NOTE: As the cabbage plants were early covered, the amount of seed set is very light.

THE DAIRY AND COLD STORAGE BRANCH

MATURITY OF FRUITS FOR PRECOOLED SHIPMENTS

BY EDWIN SMITH, B.Sc., IN CHARGE OF GRIMSBY PRECOOLING AND COLD STORAGE WAREHOUSE

THE proper degree of maturity or ripeness of fruit at the time of picking is one of the most important factors governing the condition of its arrival at market destination. Great loss is incurred each year by fruit-growers through their ignorance of the proper degree of maturity at which fruit should be picked. Mistakes are made both in leaving the fruit too long before picking, and in picking it before maturity. The success of a great many fruit-growers may be attributed to their ability to consider how their fruit is to appear on the market, which leads to their using good judgment in timing their pickings. It follows that growers who are careful about maturity are careful about packing.

In connection with the experiments in fruit precooling undertaken by the Department at Grimsby, Ont., maturity tests have been made

to determine the proper degree of maturity at which fruit should be picked for precooled shipments. In illustrating the different degrees of maturity, colour photography was used to show the exact colour of the different stages tested. Mr. F. P. Macklem of Toronto carried out the photographic work from which the accompanying coloured plates were reproduced.

The distinction between maturity and ripeness cannot be closely drawn, as some fruits are not fully mature until ripe; while others, such as the pear and apple, may be mature and ready for picking weeks or months before they are ripe. In this discussion "mature" fruit will be referred to as being ready for picking; "ripe" fruit as that being fit for eating; immature fruit will be referred to as "green"; whereas "medium ripe" will indicate that the fruit is undergoing the last of the ripening

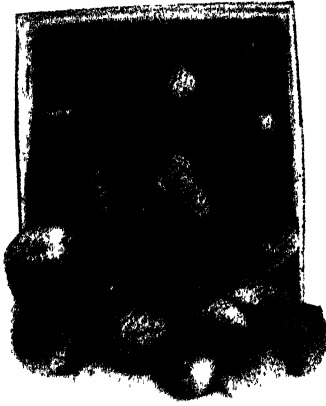


FIG. 1. CORRECT DEGREE OF MATURITY FOR
A PRECOOLED REFRIGERATED SHIPMENT
OF FROM FOUR TO SIX DAYS

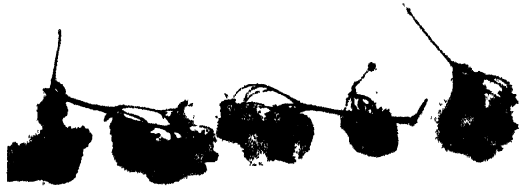


FIG. 2. STAGES OF RIPENESS, GLENMARY STRAWBERRIES

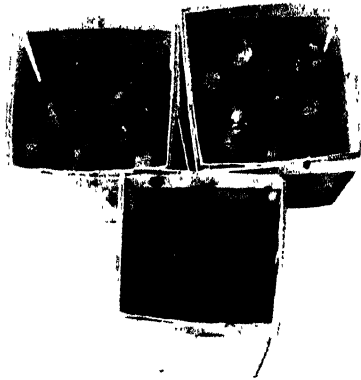


FIG. 3. THREE DEGREES OF MATURITY FOR
STORAGE

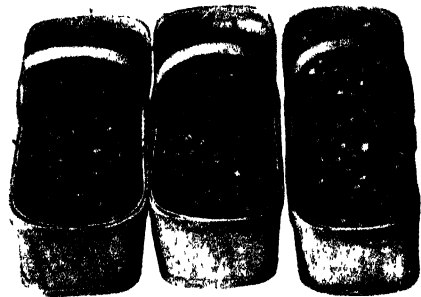


FIG. 4. THREE DEGREES OF MATURITY,
MONTMORENCY CHERRIES

MATURITY OF FRUITS FOR PRECOOLED SHIPMENTS

processes, but is not yet fit for eating on account of its firmness.

Strawberries will colour under ventilated shipment, they may be picked with little colour and yet advance in colour sufficiently before reaching the market. Under refrigeration (40 degrees or less) the colour of strawberries advances very slowly, so that when precooled before shipment they should be allowed to secure more colour than under ventilated or ordinary refrigerated shipment, since in the latter the fruit is at a comparatively high temperature for from 24 to 48 hours after loading in the cars.

Tests have shown that the medium ripe stage shown in Figure one, or the central clusters in Figure two, is the proper degree of maturity for a precooled refrigerated shipment of from four to six days. For a four-day shipment without precooling, the berries should have a colour similar to that of the berries in the clusters at the left of Figure two. Strawberries may be picked at very nearly the ripe stage when local markets are at hand, but when this stage is allowed to advance too far, pickers are apt to include soft fruit which will not stand package pressure. The riper the berries at the time of picking the better will be the quality of the fruit.

Strawberries should not be picked for refrigeration at the green stage, as upon removal they will deteriorate before advancing in colour. It is also noticeable that when green-picked strawberries are held under refrigeration they discolour wherever they are bruised or are touching. This discolouration is evident in the bottom box in Figure three.

In determining the maturity of a strawberry for a precooled shipment, much depends upon the texture and solidity of the fruit. Berries being very firm and having that rubbery touch and bright sheen that are always indicative of good carrying quality, may be picked at a ripe

stage, and still stand a precooled shipment of three days. Since pickers are not able to discriminate carefully as to texture and firmness, it is always safest to use colour as a standard, and have them pick at the medium stage for distance shipments.

When using colour as the chief indication of the proper degree of maturity, a great deal depends upon the variety of strawberries. The colour shown in the medium ripe Glen Mary in Figure two will not be attained by the Williams. Good judgment and a knowledge of the manner of ripening of the variety in question are always necessary to determine the proper degree of ripeness for any particular shipment.

For precooled shipment, sour cherries should remain on the tree till well coloured, but should be picked while firm. Successful shipments of ripe Montmorencies have been made to Winnipeg by refrigerated freight. When allowed to reach the deep red colour at the left of Figure four the cherries are apt to be soft and easily crushed. Sour cherries should never be picked as green as is shown in the right of Figure four, as they never attain a good colour, are underdeveloped, and are always lacking in quality.

The ripe stage of maturity shows discolouration and decay much sooner than either of the other stages, hence should not be used in precooled shipments over four days in length. The medium degree of maturity (center basket in Figure four) will stand a precooled shipment of ten days. In selecting this medium degree of ripeness, a good rich colour and good size are to be desired while the fruit is still firm.

The colour of plums does not advance greatly under refrigeration. Such a tender variety as the Burbank stands a refrigerated freight shipment from Grimsby to Brandon and remains in good market condition for four or five days after removal. Consequently, this variety,

which has to be picked before coloured in order to get firmness, had ample time to advance to a rich wine colour upon withdrawal from the refrigerator car. The Abundance and Burbank must be picked when just starting to show a reddish cast in order to get firmness. With the exception of the Washington, Imperial and Lombard, which varieties should be used with caution in long distance shipments, the more common varieties of plums grown in the Niagara district should be allowed to become medium ripe before picking.

If peaches are allowed to become ripe before picking for precooled shipments, the flesh is apt to become mealy before market is reached. Peaches should be very firm for precooled shipments, having a medium ripeness wherein the green ground colour is starting to turn

to a yellow tinge; in the case of a white fleshed peach, picking should take place when the ground colour is losing its deep green shade. Peaches advance in colour but slowly while under refrigeration. Upon removal from storage they continue to advance in colour, this being more evident with the ground colour of the skin than it is with the red blush.

With the shipment of any fruit, the degree of maturity at which it is to be picked must be determined according to the manner and distance of shipment, paying special attention to whether it is to be precooled, shipped under ordinary refrigeration, or under ventilation only. Other conditions being the same, more advanced maturity may be allowed when fruits are precooled for shipment.

THE ENTOMOLOGICAL BRANCH

THE INTRODUCTION AND ESTABLISHMENT IN CANADA OF THE NATURAL ENEMIES OF THE BROWN-TAIL AND GIPSY MOTHS

ONE of the most interesting and valuable lines of work that has been undertaken by the Entomological Branch is the introduction into Canada of the natural enemies of the brown-tail moth and gipsy moth. The brown-tail moth was first discovered in Nova Scotia in 1907 and in New Brunswick in 1910, both infestations resulting from the widespread infestation occurring in the New England States. Up to the present time seven counties in Nova Scotia and eleven counties in New Brunswick have been infested. In both provinces, but particularly in the latter, the insect has been prevented from increasing by a thorough inspection of the whole of the infested and

likely-to-be infested territory and the destruction of the winter webs containing the hibernating caterpillars. This artificial control, however, is subject to limitation by numbers, the present system of collecting webs being only practicable so long as the infestation is not too heavy. But the north-easterly spread of the brown-tail moth in gradually increasing numbers from the New England States continues. Further, the gipsy moth, which will find suitable food plants in eastern Canada, is now within about fifty miles of the international boundary.

In view of the practical impossibility of artificially controlling the brown-tail moth now within our territories and the gipsy moth

when it arrives, it was decided to profit by the experience that the United States had gained at great cost, and to endeavour to assist in the natural control of these pests by introducing their natural enemies. In this task we were fortunate in securing the co-operation of the Bureau of Entomology of the United States Department of Agriculture, thanks to the kindness of Dr. L. O. Howard, the Chief of the Bureau, who has given us every facility and help, and for which assistance we are most grateful. Realising that the ultimate control of two introduced insects such as the brown-tail and gipsy moths could only be secured by natural means, and as the insect enemies of these insects native to New England did not cause any appreciable reduction in their numbers, the United States Bureau of Entomology, in co-operation with the State of Massachusetts, started to introduce the parasites and natural enemies from the native homes of these insects in Europe and Japan in 1905. Each year a large amount of parasitised material has been imported and as a result of an enormous amount of labour and the expenditure of about a quarter of a million dollars, seven species of parasites and a predacious beetle (*Calosoma sycophanta*) have been successfully established in New England and are spreading.

Instead of being compelled to go to Europe and Japan for our parasites, through the cordial co-operation of the United States Bureau of Entomology, to which I have referred, we are able to collect our material in those parts of New England in which the European natural enemies have been colonised. As the brown-tail moth is only lightly scattered over New Brunswick and Nova Scotia, in fact it cannot be said to have become established in New Brunswick owing to our thorough scouting work since its first discovery, and as the gipsy moth has not yet arrived, it was

necessary, in order to establish the natural enemies of these insects, to choose species of parasites which will attack and establish themselves on certain of our native insects. Our object in this work is to establish the natural enemies of the gipsy moth and brown-tail moth in eastern Canada before these pests arrive in great numbers, so that the problem of ultimate control will be very materially advanced, and the losses will, therefore, be considerably lessened. Our work is comparable to the taking of military precautions against an invasion; instead of allowing the enemy to spread over one's territory before taking protective measures, we are preparing our territory for the arrival of the enemy.

We commenced importing the parasites from Massachusetts in 1911 and the work has increased annually. In order to give some idea as to the progress of this work and the methods that we are following in carrying it out, I have requested the officers in charge of the work to describe the different sections for which they are responsible. In the first article, which follows this introduction, Mr. L. S. McLaine, our Field Officer, who has charge of the work of collecting the parasites and predacious beetles in New England, in addition to being responsible for the brown-tail moth inspection work in New Brunswick, describes the methods of collecting and rearing in New England and shipping to New Brunswick the natural enemies we are importing.

The headquarters for this work is the Entomological Laboratory at Fredericton, N.B., and in next month's issue of THE AGRICULTURAL GAZETTE the colonization and principles governing the distribution of the parasites will be described by Mr. J. D. Tothill, Field Officer in charge of that branch of the work.

C. GORDON HEWITT,
Dominion Entomologist.

REARING THE PARASITES OF THE BROWN-TAIL MOTH IN NEW ENGLAND FOR COLONIZATION IN CANADA

BY LEONARD S. MCLAINE, M.Sc., FIELD OFFICER, ENTOMOLOGICAL LABORATORY, FREDERICTON, N.B.

WHEN the brown-tail moth made its appearance in the provinces of New Brunswick and Nova Scotia the Entomological Branch decided to adopt two distinct methods of control, the artificial and natural, in order to try to curtail the ravages of this insect as much as possible. The artificial control is carried out by the collection and destruction of the brown-tail winter webs containing the hibernating caterpillars, and the spraying of the worst infested orchards with lead arsenate. This method is practical in settled communities, but in the case of infested woodlands it is out of the question on account of the tremendous cost and the difficulty of obtaining satisfactory results. To check the increase of the insect in the woodland it is necessary to use the natural means of control, and by this is meant the importation and distribution of other insects which are parasitic and predacious on the noxious host. Through the courtesy of Dr. L. O. Howard, Chief of the United States Bureau of Entomology the raising of these parasites has been carried on for the past four seasons at the United States Gipsy Moth laboratory, Melrose Highlands, Massachusetts. The Entomological Branch has stationed three men at Melrose Highlands each season for this work.

The brown-tail moth is a native of Europe and was accidentally imported into the United States. At the time of introduction either the parasites were not brought in with it or else they were unable to withstand the change of climate. It increased enormously in numbers and spread rapidly. The United States Bureau of Entomology then imported large numbers of various species of para-

sites and several of these have become thoroughly established, so that further European importations of these particular species became unnecessary. As the brown-tail moth has spread over such a large area and as the natural distribution of the parasites is comparatively slow, it is necessary to assist nature in the distribution of these parasites by artificially raising and colonizing them in localities into which they have not had sufficient time to spread.

On account of the comparatively light and widespread area of infestation of the brown-tail moth in Canada, it was necessary to select parasites which were parasitic not only upon the brown-tail moth but also upon native insects, otherwise the chances of the parasites becoming firmly established would be greatly reduced. Two species of parasites, *Apanteles lacteicolor* Vier. and *Compsilura concinnata* Meig., and one predacious beetle *Calosoma sycophanta* L., seemed to be suitable to fulfill these conditions.

Apanteles lacteicolor is a small hymenopterous parasite measuring only 2.5 mm. in length. The female *Apanteles* deposits an egg under the skin of the young brown-tail caterpillar in the fall. The egg hatches and the young parasitic larva develops slowly during the fall in the body of its host, remaining passive within the body of the hibernating caterpillar during the winter. Upon the appearance of spring and the bursting of the leaf buds, the caterpillars emerge from their winter quarters and commence feeding upon the opening buds. The parasites likewise awaken from their long rest and start to feed upon the body of their host; they first devour the less vital portions but finally, soon after the

second moult, they kill the caterpillar and emerge from its body. After emerging the parasite spins a silken cocoon about itself and about ten

stage that they are forwarded to Canada for colonization.

During the winter months brown-tail webs are collected from points



FIG. 1 Collecting cocoons of *Apanteles lacteicolor* in tray in which they have been reared from caterpillars of Brown-tail Moth. Note rubber gloves to prevent the affection known as "Brown-tail rash" caused by poisonous hairs from the caterpillars, from developing on the hands. (Original)

days later emerges as an adult insect. *Apanteles lacteicolor* has two or three generations a year; after emerging from the brown-tail caterpillars it may attack either the gypsy, *Datana* or *Hyphantria* caterpillars, the second or third generation carrying them

where *Apanteles lacteicolor* is known to be firmly established and fairly abundant. The webs are then placed in cold storage to retard the emergence of the caterpillars until the wild cherries have developed leaves in the spring. When the cherries are

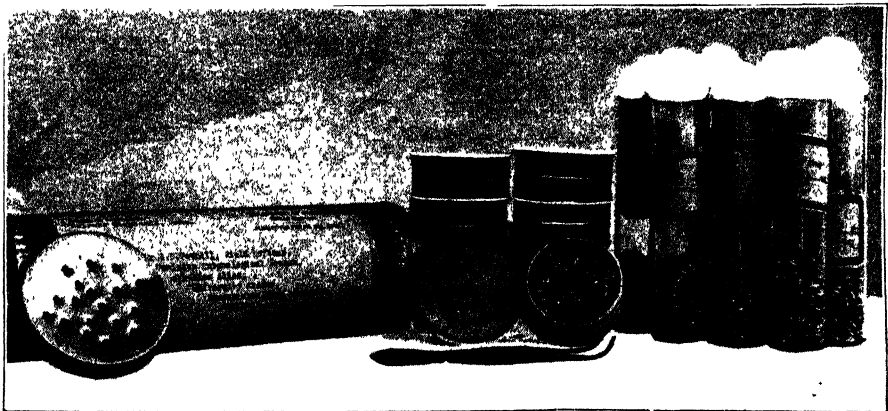


FIG. 2.—Showing the method employed in shipping the cocoons of *Apanteles* to Canada for colonization. (Original).

through until the young brown-tails have hatched in the fall. It is while the parasites are in the cocoon

in full leaf the webs are removed from cold storage and placed in trays. The trays are rectangular in shape

with wooden sides about six inches in depth. The upper portion of the inside of the tray is covered with "tanglefoot" to prevent the escape of the caterpillars, the bottom of the tray being covered with cloth drawn tightly and pasted to the sides. The webs are covered with mosquito netting upon which cherry leaves are placed as food for the emerging caterpillars. When all the caterpillars have left the webs, the mosquito netting is rolled back and the empty webs removed. The caterpillars are then fed three or four times daily until the emergence of the parasites is noted. A second mosquito netting is then placed on the tray and fresh foliage spread over it, which draws up all the live caterpillars. The second netting

color cocoons have been forwarded to Canada for colonization.

Compsilura concinnata is a Tachinid fly resembling somewhat the common house-fly but slightly smaller. It differs from the house-fly in that it is always a parasitic insect and does not normally enter houses. The female fly deposits a newly hatched larva beneath the skin of the young brown-tail or gipsy caterpillar in the spring. In about two weeks the larva kills its host and emerges as a maggot, which soon forms a puparium about itself. Ten days later the adult fly emerges from the puparium. *Compsilura* has two or three generations a year and is recorded as having about fifty different species of insects as hosts. On account of the oftentimes severe



FIG. 3.—Feeding caterpillars of Gipsy moth on oak foliage in Fiske tray to obtain puparia of *Compsilura*. Remains of caterpillars that have been parasitised and puparia may be seen among the healthy caterpillars. (Original).

together with the caterpillars is then transferred to another tray. The first tray is closely examined for the *Apanteles* cocoons, the dead foliage being turned over leaf by leaf and the cocoons removed carefully by forceps to glass vials. The cocoons are placed in an ice chest to retard the development of the adults until it is time to colonize them in the field. When a sufficient number of cocoons are collected, they are removed from the ice chest, transferred to pill boxes, a thousand to a box, and the latter are placed in mailing tubes which are forwarded to the point of liberation. During the past three years 67,500 *Apanteles lactei-*

poisoning contracted by handling the brown-tail caterpillars, *Compsilura* is reared from the caterpillars of the gipsy moth. The gipsy caterpillars are collected after being parasitised, in the field, brought into the laboratory and placed in trays. The caterpillars are fed on white oak foliage, which is kept fresh and palatable by placing the stems in bottles of water. A daily examination of the trays is made, the *Compsilura* puparia removed and placed in a glass vial in the ice chest. When a shipment is to be made the puparia are removed and packed in a small wooden box containing damp moss. Fifteen thousand puparia have been

forwarded for colonization during the past three years and these were obtained from 146,000 gipsy caterpillars collected in the field.

Calosoma sycophanta is a brilliantly coloured green beetle, measuring a little over an inch in length. It is predacious in its habits and feeds readily on nearly all species of caterpillars. Experiments show that the average number of gipsy and tent caterpillars killed by a single beetle in a season was 328. The beetles live from two to four years, hibernating

of colonizing these beetles, especially when they have to be shipped to any great distance, is to collect them in the adult stage. Both the beetles and larvæ are great climbers and the most suitable localities for making collections are in young oak woods with the trees three or four inches in diameter and where the gipsy caterpillars are abundant. The saplings are given a kick and any beetles that may be feeding are jarred off and fall to the ground. The collector needs to be alert, as a beetle on reach-

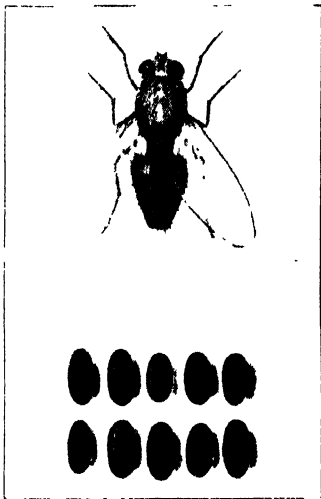


FIG. 4 — The Tachinid fly *Comptosia concinnata*, showing adult fly and puparia. (After Bureau of Entomology, U. S. Dept. of Agriculture)

in the ground during the winter. The adults emerge from their winter quarters about the first of June, feed for a few days and then the females deposit their eggs in the ground. A single female has been recorded as laying as many as 653 eggs. From three to ten days later the eggs hatch and the newly hatched larvæ commence to feed, attacking caterpillars or pupæ regardless of size. The larvæ moult three times and then pass into the ground, pupate and hibernate as adult beetles during the winter. The most satisfactory method



FIG. 5 — The Calosoma Beetle, *Calosoma sycophanta*. Showing eggs, larvæ and pupa of the beetle and an adult beetle devouring a Gipsy Moth caterpillar. (After Bureau of Entomology, U. S. Dept. of Agriculture)

ing ground will rapidly crawl under any leaf, piece of bark, stone, etc., and remain perfectly quiet. The beetles are shipped in colonies of 100, fifty males and fifty females. They are placed in small wooden boxes covered with wire mosquito netting and packed in damp moss. In this way they are kept damp and can travel great distances with a very low percentage of mortality. So far 3,400 adult beetles have been forwarded to Canada.

THE FRUIT BRANCH

THE FRUIT CROP OF 1915

BY D. JOHNSON, COMMISSIONER

THE fruit crop of 1915 will pass into history as one which presented many difficulties to the producer. Early in May the blossom gave promise of a tremendous crop of fruit, but frosts the latter part of the month seriously affected conditions. The districts lying beside large bodies of water, and in certain favoured localities were more or less protected from the frost and produced a fair crop of fruit. Berries were somewhat reduced in quantity but met with good demand and the producers of soft fruit feel that they have had a successful season. The peach orchards of Canada fulfilled their early promise and gave, probably, the largest crop Canada ever produced, which, though possibly lacking somewhat in appearance owing to the continued damp weather in the early part of the season, moved into consumption at a fair price to the grower. Pears were decidedly short, and plums a medium crop of good quality which met with excellent demand.

The apple crop, even after the serious frost of May 27th, gave promise to the growers of turning out fairly well. The trees set well and it was not until July that the real difficulty presented itself. The cold, damp weather had developed fungous growth, which attacked not only the fruit, but the foliage and the stems of the apples, causing them to drop seriously. The vitality of the trees was weakened and except where the most careful spraying was done, the apples developed very poorly. Fully 75 per cent of the apples in Ontario were affected by scab,

which resulted in the larger part of the crop being packed as No. 3's. This required great care on the part of our inspectors and every effort was made to inspect as much as possible of the fruit at the point of shipment, instructing the grower how to pack his fruit under such conditions in order that he might make the most of his fruit and still protect the consumer from fraudulent packing. In Nova Scotia the same conditions existed and even in British Columbia.

The price of apples, however, has been high even for inferior grades of fruit; and high grade apples are now selling at from five to seven dollars per barrel wholesale in the large domestic markets and as high as from five to five-fifty f.o.b. has been offered for good, clean No. 1 Spies. It appears now that there will be a decided shortage in apples by the early spring owing to the fact that the No. 3's (the great proportion of the stock on hand) will not keep, leaving a decided shortage in the other grades.

The British markets have been exceedingly strong and for good fruit have paid the highest prices that have been known for many years, No. 1 Snows, for instance, having wholesaled at 40s. per barrel.

Some good lessons have been learned by this year's experience, one of which is the absolute necessity for thorough and careful spraying of fruit trees. Those who carried out this fundamental principle have in nearly every case been rewarded by a good crop of clean fruit, which has graded No. 1 and is now bringing high prices.

THE INTERNATIONAL INSTITUTE BRANCH

THE INTERNATIONAL INSTITUTE OF AGRICULTURE AND THE WAR

BY T. K. DOHERTY, LL.B., INSTITUTE COMMISSIONER FOR CANADA

FROM information recently received from the Institute at Rome, it appears that, owing to the outbreak of war, 42 employees of the Institute, who ordinarily number about 100, have had to leave Rome either because they were called to serve under the colours of their respective countries, or because they belong to countries with which Italy is now at war. But, notwithstanding this serious depletion of the staff, the regular work of the Institute continues to be carried on with commendable punctuality. The three monthly bulletins appear regularly with hardly any delay, the Year Book of Legislation and the important Year Book of Agricultural Statistics have been published and a few copies have been sent to every adhering government.

In the ordinary course, in accordance with the Statutes of the Institute, the meetings of the permanent committee were resumed at the end of October and were attended by Sir James Wilson, K.C.S.I., representing Great Britain and the other British Dominions, and by Sir Edward Buck, K.C.S.I., LL.D., representing India.

The number of States adhering to the Institute has now risen to 55, but as several of them are represented by the same delegate, the total number of delegates is at present forty. Four of these States, namely, Germany, Austria, Hungary and Turkey, being at war with Italy, their four representatives found it necessary to leave Rome before a state of war existed between

Italy and Austria. The president's efforts to secure permission for these four delegates to reside in Italy have not succeeded. At such a critical time it is difficult for the permanent committee to look with a single eye to the permanent objects of the Institute, to maintain its attitude of absolute impartiality, and to avoid taking such action as may be, rightly or wrongly, considered to favour one or other side of the belligerent nations.

Strange though it may seem, the Central Allies continue monthly their collaboration with the Institute. The difficulties consequent on the closure of the Italian frontiers to the mails coming from Germany and Austria-Hungary have been overcome through an arrangement made at the Institute's request with its official representative for Switzerland, Dr. Laur. Dr. Laur has agreed for the time being to have the papers and reviews from those countries which cannot enter Italy gone through and abstracts made in Switzerland. To facilitate this work one of the employees of the Institute Bureau of Agricultural Intelligence has been sent to assist Dr. Laur.

Dr. M. Mueller, delegate of Germany on the permanent committee, during his enforced absence in Germany is taking a great interest in securing the regular publication, as far as possible, of the German edition of the two large bulletins. Through arrangements which the Institute made with him just before he left Rome on the outbreak of hostilities, the translation and print-

ing of the German edition is done in Germany under his direction, with the assistance of employees of the Institute who are now in Germany. Dr. Laur is also assisting in this work.

From the General Secretary's early autumn report to the president for the information of the members of the permanent committee, it appears that the financial position of the Institute, as resulting from the account of receipts and expenditures up to the 30th of June, was most satisfactory, exceeding what the officials had a right to expect

in view of the international situation.

The receipts on account of ordinary expenditure amounted to 1,197,000 lire or \$239,400.00 and the pledged expenses to 872,000 lire or \$174,400.00, leaving 325,000 lire or \$65,000.00, of a surplus, a sum of 36,000 lire or \$7,200.00 in excess of the estimated surplus foreseen.

The Government of Australia have recently shown their appreciation of the Institute by deciding to subscribe to it under Group III instead of Group IV as hitherto, and by paying their enhanced subscription of £400 for the current year.

THE LIVE STOCK BRANCH

THE MARKETING PROBLEM

RECENTLY the Live Stock Branch of the Federal Department of Agriculture has been paying special attention, under the personal attention of the Assistant Commissioner, to the marketing of live stock with a view to improving the facilities for trading and transportation. In the course of the investigation as to the situation and the requirements much valuable information has been secured. While the increase of production has not kept pace with the increase of population, yet it is estimated that the value of live stock in Canada reaches the imposing total of \$750,000,000, or three-quarters of a billion dollars. To make the most of an industry of so great importance it is felt that there is a grave problem to be solved involving alike the interest of the producer and consumer in alliance with the shipping and railway companies, the middle man and the packer, and the banker. All these interests have to be regarded, hence the difficulties of the situation and hence the value of the information which the Live Stock Branch have

secured and brought up to the latest possible date.

THE SITUATION AS IT EXISTS

The progress that has been made in pursuance of the marketing of such products as wool and eggs has been indicated from time to time in THE AGRICULTURAL GAZETTE (see Vol. II, pages 150, 392, 772, 872 and 1180 regarding the marketing of wool and pages 226, 227, 877 and 945 as regards eggs), and while sight has not been lost of other matters the existing state of affairs, particularly in Europe, has brought the live stock industry prominently into both public and official notice. Whereas Canada between 1890 and 1905 sold large numbers of cattle and of sheep and quantities of bacon to Great Britain and the United States, following that period there was a gradual decline until in 1910 and 1911 the exports of these products was practically *nil*. In 1913 there came a revival and in 1914 and 1915 the movements have gone on developing. For the year 1911-12 the

agricultural exports amounted to 53 per cent of the total exports of the Dominion; in 1912-13 to 58 per cent; in 1913-14 to 54 per cent and for ten months of 1915 to 47 per cent. While the exports in the last-mentioned period exceeded the imports by \$35,600,259, the increase was mainly due to shipment of war supplies, hence the apparent decrease in the percentage of agricultural products.

THE EUROPEAN DEMAND

Canada had last year, the information acquired shows, a surplus of cattle to export. Up to October 31st from Western Canada had been sent 38,629 feeders, mostly to St. Paul, Minn., and 16,336 butchers, mainly to Chicago. From Eastern Canada had gone 10,679 head of cattle to France and a large number of canners and cutters, as well as a number of high-class export cattle, to New England. Of canned beef during the same period 9,620,882 lb. and of dressed beef 21,753,672 lb. had been shipped principally to the British government for military consumption. A few car loads of frozen dressed beef have also gone forward for the same purpose. But Great Britain is not alone in these requirements. A former Minister of Commerce for France has said that France will need to import annually at least 200,000 tons of cold storage meat from now on until some years after peace has returned. There is evidence to show that all the countries of Europe, Russia probably alone excepted, will need to import large quantities of animal food. Even in the United States it is recognized that the exportation of cattle, alive or dead, cannot go on without a considerable increase in production. Stockmen in that country have given freely as their opinion, that the present is Canada's opportunity not only to secure an important place in the world's live stock markets but, so firmly to get

in, that her position will be assured for all time.

THE HOG MARKET

What has been said of cattle is true of sheep and swine. Denmark has hitherto been the largest base of supply. To the end of October it is on record that Denmark killed 700,000 fewer pigs than in the same period of 1915. This would seem to imply not that the demand was less but that live animals were being driven into Germany. While Denmark's production is being reduced, and her herds being depleted, the demand in Britain and France is becoming even more urgent and insistent. Ireland is the other immediate source of supply, but there is not wanting evidence that Ireland cannot make up the deficiency. Hence the countries in need must turn to the United States and Canada. This country's sales of bacon alone for ten months of last year, or to the end of October, aggregated in value \$16,000,000, being an increase of about three hundred per cent compared with the same period in the previous year. An illustration of Canada's position lies in the price quoted for the different types of bacon on the British market. Danish is now bringing 95 and 99 shillings per cwt; Canadian between 85 and 88, while American is quoted only at from 72 to 76. The United States is clearly unable to compete with Canada on an equal basis for trade with Great Britain in pork products. The reason for this, of course, lies in the fact that Canada produces a bacon hog from which Wiltshire sides may be cured. From the American hog good Wiltshire bacon cannot be produced. In these circumstances Great Britain is looking to Canada to make up her shortage in the supply of bacon.

EXPORTATION OF SHEEP

Relative to sheep an uncommon feature is to be found in the fact

that while as a rule any surplus that Canada may have is converted into mutton and put into cold storage, last year during the months of September and October 47,000 head were exported, mainly to New England. This exportation has held up prices and it is thought that before spring opens out lamb will be a dear and scarce commodity. That Canada should be called upon to send sheep abroad is regarded as a sure and certain sign of the state of affairs elsewhere and the demand that is bound to arise.

THE NECESSARY POLICY

Summing up the situation, it is clear that, however much the situation in Europe is to be deplored, it opens up great opportunities for Canada, the

full realization of which can only come about by persistent and intelligent effort, and by, as the Assistant Commissioner has suggested, a recognition of the following facts: —

1. That the producer cannot continue to do business without a steady profit.

2. That the packers render a legitimate service in the live stock trade in the distribution of the product.

3. That the railway must expect to obtain a reasonable toll in acting as carriers of the goods to the consumer.

4. That the banks can render efficient help in providing facilities under reasonable terms for the financing of every feature of the trade.

THE SEED BRANCH

FIELD ROOT AND VEGETABLE SEED

BY GEO. H. CLARK, B.S.A., COMMISSIONER

THE war in Europe is bound to make countries that have been importing raw material, as well as manufactured articles, from the belligerent states try to be self-reliant. Particularly is this true as regards Germany, from which country, as well as from France, large quantities of field root and vegetable seeds have hitherto been imported. The facts in connection with the situation up to the end of 1913 were detailed in THE AGRICULTURAL GAZETTE, Vol. 1, October, 1914, page 771. From these sources we learn that in 1913, there were imported from France 452,721 pounds of beet and mangel seed and from Germany 448,023 pounds. From France also came 126,687 pounds of turnip seed and 33,000 pounds of carrot seed. In short, apart from corn, beans and peas, most of our vegetable seeds have been grown outside the country. Tomato, onion, cucumber and

melon seeds come largely from the United States, and cabbage, cauliflower, celery, parsnip, garden beets, radish and similar crops from European seed. Florist stocks come principally from Germany.

Canadian experience in growing field root and vegetable seeds has been rather limited. Aside from that grown at the Dominion experimental farms and at the agricultural colleges, individual cases are on record of farmers and gardeners growing seeds for their own use and some for sale. A number of farmers in Yarmouth county, Nova Scotia, have been growing swede seed for many years, with excellent results. The average yield is about 1,100 pounds of swede seed per acre. This seed has found ready sale, being deemed superior to the imported seed, both in germination and in yield per acre of the resulting crop.

SUBVENTIONS TO GROWERS

Succeeding some successful experiments extending over four years ending in June, 1912, the Honourable the Minister of Agriculture, wishing to secure further information from actual test, authorized the payment of subventions to growers of certain kinds of seeds, including mangel, sugar beet, turnips or swedes, carrots, beets (garden varieties), parsnip, radish, cabbage, tomato, onion, celery, lettuce, cucumber, water-melon and muskmelon. Twelve growers in 1913 and eleven in 1914 took advantage of these subventions, 10,700 pounds of root and vegetable seeds being produced in the former year and 3,332 in the latter. This was the situation on the outbreak of war in August, 1914, when the available and future supplies of field root and vegetable seeds which had been obtained largely from the belligerent countries demanded prompt attention. After a careful study of the situation farmers and gardeners were advised through the press to make a beginning in a small way so that by the acquiring of knowledge they might be in a position to undertake the growing of these seeds for the trade. The district officers of the Seed Branch got in touch with likely growers, and interested them in selecting and storing parent stocks for the spring planting. The Experimental Farms Branch Bulletin No. 22, Growing Field Root, Vegetable, and Flower Seeds in Canada, was issued and distributed as a basis of information.

INFORMATION FROM SYSTEMATIC INQUIRY

Careful notes have been taken in the field on each variety of seed crop and the reports compiled include information based on answers to questions regarding the origin of the stock, how long grown, origin of seed

plants, seed area, spacing, date of planting, date of harvesting, stand of plants, purity and uniformity of plants, vigour of growth, nature of soil, manures and fertilizers used, cultivation, weeds, danger of crossing, injury from insects, diseases, etc., state and uniformity of maturity, yield estimated from number, size and filling of seed vessels, amount for sale and previous experience of seed crop. To these questions seven replies regarding swede, cabbage and parsnip were received from Prince Edward Island; twenty-three regarding swedes, mangels, carrots, beets, parsnip and cabbage from Nova Scotia; three regarding swedes, carrots, beets, and parsnips from New Brunswick; seventy-five regarding every variety previously mentioned and onion, lettuce, radish, cucumber and muskmelon, from Quebec; thirty-nine regarding every species and including tomatoes, from Ontario; three regarding sugar beet, radish, parsnip, lettuce and swede, from Alberta; and thirteen regarding mangels, cabbage, sugar beets, parsnips, carrots, onions, tomatoes, cucumbers, water melon and muskmelon from British Columbia.

It is satisfactory to be assured that a continuation of supplies is certain from France, Great Britain and Holland for 1916 at normal prices for standard sorts such as cabbage 75c. a pound and radish 16 to 17c. A sharp increase, however, is noted for garden carrots, 40 to 45c., and field carrots, 40c. Turnips are offered at 11 to 13c., swedes at 14c. and mangels 11 to 12c. Scarcity of labour and the high price of food crops are responsible for the increases.

The growing of root and vegetable seed is still in the experimental stages with most of our Canadian growers, but this year's experience gives more confidence in the possibility of home production.

THE HEALTH OF ANIMALS BRANCH

THE ANIMAL CONTAGIOUS DISEASES ACT AMENDED

THE Order under "The Animal Contagious Diseases Act," of date the 9th day of September, 1915, as amended by Orders of date the 28th day of October, 9th and 15th of November, 1915, is hereby further amended by striking out the word "Minnesota" in the first paragraph thereof and inserting it after the word "Oklahoma" in section 32.

Dated at Ottawa this 26th day of November, 1915.

(Sgd.) GEO. F. O'HALLORAN,
Deputy Minister of Agriculture.

The Order under "The Animal Contagious Diseases Act," of date the 9th day of September, 1915, as amended by Orders of date the 28th day of October, 9th, 15th and 26th of November, 1915, (as published respectively in THE AGRICULTURAL GAZETTE of October, November and December, pages 990, 1031 and 1151) is hereby further amended by striking out the word "three" in the second line of the first paragraph and substituting therefor the word "four," and by adding the words "or scalded" after the word "singed" in the fifth and tenth paragraphs of Section 8, and by substituting for Section 29 the following:

"Hay or straw used in packing merchandise will be admitted, except from the state of Illinois. Goods from the state of Illinois, packed in hay or straw, will not be admitted unless the said hay or straw has been

disinfected with formaldehyde and is so certified by an officer of the Bureau of Animal Industry."

The Order is further amended by adding the following sections:

"(35) The transit through Canada of carload shipments of live cattle, sheep or hogs, from any point in the state of Michigan to any point in the state of New York is permitted under the following conditions:

(a) Cars must enter Canada at Windsor or Sarnia and leave at Niagara Falls or Bridgeburg.

(b) Cars must be sealed and not unloaded when in Canada. In case of accident while in transit through Canada the railway company must promptly notify the Veterinary Director General and assume responsibility for all damages.

(c) Cars must be accompanied by the affidavit of the shipper, endorsed by an officer of the Bureau of Animal Industry, that all the animals comprising the shipment originated in the state of Michigan and have not been brought into the state from elsewhere during the past year.

(d) The regulations regarding cleanliness of cars, disinfection, fitting with foot-boards, etc., must be complied with.

(36) Sheep casings packed in salt may be admitted.

Dated at Ottawa this 6th day of December, 1915.

(Sgd.) GEO. F. O'HALLORAN,
Deputy Minister of Agriculture.

PART II

Provincial Departments of Agriculture

CROP PRODUCTION IN 1915

PRINCE EDWARD ISLAND

BY THEODORE ROSS, SECRETARY FOR AGRICULTURE

THE field crops of Prince Edward Island have not done as well as usual this year. The weather was unfavourable. The season opened late. Seeding is generally common on May 10th, and concluded by the end of the month, but this year most of the seeding was done in June. Again the months of May and June and the first three weeks of July were cool, cloudy and backward. The mean temperature was only 64.3° and the hours of sunshine 186. The last week of September was cold and stormy, and on the 27th, a very heavy fall of rain accompanied by a severe wind storm damaged the grain and potato crop to a considerable extent. Western Prince County suffered most from excessive precipitation and cool weather.

Preparation was made for a con-

siderably larger acreage of wheat and oats than formerly, but some of the land intended for these crops, was sown to barley and buckwheat, on account of the excess of moisture, while the lower lying lands, which are generally seeded to barley and buckwheat, were not seeded at all.

The yield of wheat has been a little greater than average on account of the increased acreage, but that of oats, barley, buckwheat, and mixed grain is considerably lower. The acreage planted with potatoes was less than usual, as the crop last year was large and there was practically no market. The bad season too, had its effect so that the crop is a little better than half normal.

Very few turnips were sowed before the 20th of June and a large percentage of the seeding was done in July.

NOVA SCOTIA

BY M. CUMMING, B.A., B.S.A., SECRETARY FOR AGRICULTURE

HAY, the king crop of Nova Scotia, yielded in 1915 nearly 30 per cent more than in the previous season. Pastures have not for years been as good, with the result that live stock of all kinds, especially the dairy cow, have added

much more than their average contribution to the farmer's income. On the other hand, grain and roots have fallen 20 per cent short and only the increased acreage, the result of the "Patriotism and Production" campaign, is responsible for filling the

grain bins and the root cellars. The potato grower has not harvested more than 60 per cent of his 1914 crop and the fruit grower has fared little better. Only the compensating feature of nearly double the price for potatoes and net returns for apples of from 10 to 30 per cent higher than those of 1914 have enabled the producer of these crops to approximate the returns of the previous year.

Summing everything up, one cannot say that the farmer of 1915 will be much better off than his predecessor of 1914. Nevertheless there are some features of the season just passed which are worth chronicling as indicative of future development.

RAPID DEVELOPMENT OF DAIRYING

Outstanding among these features is the continued development of dairying. When one considers that from 1910 to 1914 the output of the co-operative creameries of Nova Scotia increased 360 per cent, and when one further learns that 1915 has witnessed a 40 per cent further increase, one must perceive a growth along lines for which the eastern provinces of Canada are especially adapted. Even more striking than the increased gross returns are the reports from individual farmers everywhere of increased revenues, sometimes double, from their herds, due to better breeding, feeding and selection.

In this connection, the eastern farmer is reaping a benefit from the big crops of his western colleague, for he is able to purchase his bran and middlings and oats about 20 per cent cheaper than last year, and these cheaper feeds combined with his big mows of hay should lead to better care of live stock of all kinds. The one counteracting tendency is the high prices prevailing for hay, which are leading farmers in some parts to sell this product and reduce their stock accordingly. Although this does not augur very well for the future development of the farm, yet

the farmer who nets for his hay \$15.00 or more per ton in an occasional season can, by buying extra fertilizers with a part of his profits grow more hood crops and clover which will soon restore conditions.

LESSONS OF THE YEAR

Every year leaves its legacy of lessons and we think that 1915 taught some in a most impressive way. It has certainly taught the fruit grower that, if he sprays at all, he must spray thoroughly. Never have there been more No. 3 apples than last year and they have come both from unsprayed and sprayed orchards. Now some of these spraying orchard men, who, despite their spraying, gathered a large percentage of No. 3 apples, were at first inclined to say "spraying is no good", but their argument lost its force when they compared their results with those of men who were either fortunate enough or determined enough to spray both thoroughly and frequently. The missing of a single spray, especially the one just after the blossoms fell, caused many a sprayer to lose practically all the results of his three or four other sprays. His chain was no stronger than its weakest link. Perhaps all the links will be strong next year.

Exactly the same lesson was taught the potato grower. Breaking away from the college farm where thorough spraying and cultivation enabled us to harvest big crops of potatoes with practically no loss from blight, the writer thinks of one potato grower in particular who, in a section where nearly half the potatoes rotted and where none of the fields were up to average in quantity, produced 500 bushels of marketable potatoes per acre. But he sprayed four times and he began when the plants were barely four inches high.

The universal prevalence of clover even in fields which had not been seeded for years has resulted not only in a better quality of forage for the

cattle of the country, but we doubt not will leave in its wake, as clover always does, fields more fertile for the 1916 farmer than his predecessor of the past year commenced with. It is to be hoped that this legacy

together with the legacy of a better conditioned class of cattle and of better organization, especially along dairy lines, will have its effect in better farming in 1916 than the province has ever seen.

NEW BRUNSWICK

BY J. B. DAGGETT, SECRETARY FOR AGRICULTURE

THE season of 1915 in New Brunswick was a very satisfactory one from an agricultural stand-point. The campaign conducted by the federal Department of Agriculture in the interests of increased production had considerable effect.

The spring was unfavourable for seeding, much of which was late, but after seeding the weather conditions were favourable for rapid growth, with the result that the harvest as a whole was an excellent one. In some sections hay and grain were short, but the shortage was more than made up in other sections.

For the past ten years the potato has been a very large item in the agricultural production of the province, but, on account of the large crop of 1914, with the low price, and the high price of commercial fertilizer, because of war conditions, the acreage planted was not as large as in 1914. Consequently there was a shortage of upwards of four million bushels.

With the decreased acreage in potatoes, there was a corresponding increased acreage in cereals. With the exception of the counties bordering on the north shore, the harvest of grain was unusually large and of excellent quality. Turnips, of which there is a large production in the province, were an excellent crop. The same was true of all other roots. The harvest weather was ideal and the crops were harvested in splendid condition. Fruit was not up to the average, because of the cold, late spring.

Prices for all farm products have been well maintained, with the result that the farmers find themselves in excellent financial condition.

There is a growing disposition among the farmers of New Brunswick to farm a smaller acreage, but to farm more intensively, seeking a larger production per acre.

The autumn weather has been all that could be desired, with the result that a large acreage has been broken for this year's seeding.

ONTARIO.

BY W. BERT ROADHOUSE, DEPUTY MINISTER OF AGRICULTURE.

IN an old settled province like Ontario the agricultural products do not show the same fluctuation from year to year as is natural with the newer provinces, where vast areas of new land are being put under the plough each year. Notwithstanding

this fact, the returns from Ontario for the past season show a harvest vastly above the average, perhaps greater than any other in the history of the province. While the figures as to value are not yet available, it seems safe to say that from

the standpoint of dollars and cents it will prove to be one of the most valuable in the history of the province. This is the natural inference from a glance at the current market

prices and at the aggregate yields, which show considerable increases in almost every crop, as the following statistics collected by the Ontario Bureau of Industries prove:

	Bushels.	
	1914	1915
Fall Wheat	14,333,548	24,737,011
Spring Wheat	2,169,425	3,439,949
Barley	18,096,745	19,893,129
Oats	103,564,322	120,564,322
Rye	2,315,532	3,210,512
Buckwheat	4,251,421	4,278,366
Corn (for husking)	23,232,360	21,760,496
Corn (for silo,) (tons)	4,751,223	4,874,377
Mixed Grains	16,854,550	19,461,609
Hay, Clover and Alfalfa (tons)	3,842,554	4,253,763
Mangels	25,439,520	25,302,323
Turnips	46,336,708	46,598,851
Potatoes	26,717,587	13,267,023

DIFFICULTIES CONTENTED WITH

It must be borne in mind that the Ontario farmers had to contend against one of the most adverse harvest seasons in their history. Had weather conditions continued as favourable after as before the first of August, there is no doubt but that it would have added several million dollars to the final value of the crops. Heavy rains and winds, however, were general in the older sections of the province early in August and these did a great deal of damage to the wheat and the oats and to a certain degree to the barley, as well as generally delaying harvesting operations and adding much to the labour cost. Another condition against which the farmer has had to contend has been the unusual prevalence of disease and pests. Smut in oats was very prevalent and the loss, according to various estimates, ran from 10 to 25 per cent. Cut worms, grasshoppers and other insects were also numerous and did much damage in different sections. In triumphing over these adverse conditions the farmers are entitled to a great deal of credit. In fact the reports received by the Department indicate that never before was such a genuine effort put forward by the farmers to adopt the best methods of cultivation and the best varieties of seed, in fact

to do everything in their power to assure the maximum supply of food stuffs. There is no doubt but that the patriotic appeal was one of the most influential factors in this regard.

THE CROPS GENERALLY

In looking over the figures it will be noted that Ontario this year shows an unusually large crop of wheat. This was due to an increase of about 20 per cent in the acreage as well as a very large increase in the returns per acre. Ontario has been gradually going out of wheat growing, but this year endeavoured to share in the general need for an ample supply of this basis of food stuff. At the same time the attention devoted to the other crops was not decreased as the figures will indicate. The large crop of oats reflects the importance of the live stock industry in this province.

In a province with such a diversity of products as is shown in Ontario it would be unreasonable to expect uniform maximum returns throughout. The past season has fully demonstrated this fact. While the aggregate is most satisfactory, there have been lines which have suffered a shortage. Among these, perhaps the most outstanding, was the potato crop. It was cut completely in

two by reason of the heavy rains which caused blight to be particularly prevalent. The prices are, however, more than double what they were a year ago when a very heavy crop was produced. Similar adverse weather conditions interfered very much with the vegetable growers who have not had a very good season. The apple crop has been very much smaller than usual and prices correspondingly higher. The crop of tender fruits in the Niagara district was large, but owing to the difficulty in marketing, the season has not been one of special prosperity to those who are depending on these lines. The seed corn crop in Essex and Kent has also been materially affected by

the weather conditions and good seed corn will be both scarce and expensive next spring. On the other hand the returns to the live stock industry have been very satisfactory. This is particularly true of dairying. It is probable that the year 1915 will rank as one of the best years in the dairy history of the province. Feed stuffs have been plentiful, and the high prices prevailing for butter and cheese have caused the cheese factories and creameries to work for longer periods than has been usual in the past.

Altogether, however, the record of 1915, agriculturally speaking, has been such as to fill all with feelings of gratitude and confidence in the future.

MANITOBA

BY A. J. McMILLAN, B.S.A., DEPUTY MINISTER OF AGRICULTURE.

MANITOBA'S 1915 grain crop stands as a record in the history of the province. The yield of small grains is phenomenal in view of the peculiar nature of the growing season from May to July. Seeding operations were general about April 20th, which is a few days earlier than the average of several years. Following a favourable spring the early summer season was cold wet and backward, accompanied by frost early in June. This frost seriously affected barley, corn and tender vegetables. From the beginning of July to the middle of August the 1915 crop was made. During the greater part of this period the weather was extremely warm. This proved the salvation of the crop, as

the surplus of moisture in the soil allowed grain to mature rapidly without suffering from the effects of the high temperature. The harvest season was ideal, being dry and warm, but before threshing had well begun the weather broke and an abnormally wet, backward threshing season followed. Such a season could be classed as anything but ideal, yet results indicate that it was most favourable for the production of wheat, oats and barley. The following table shows the comparative acreage, total grain yield and yield per acre of the common grains in 1914 and 1915, together with the average yield per acre for a period of ten years:—

CROP	Area in Acres	1914 Average Yield	Total Yield, Bushels	Area in Acres	1915 Average Yield	Total Yield, Bushels	Average 10 Years, 1905-1914
Spring Wheat.	3,338,572	15 5	51,947,608	3,660,930	26 3	96,559,031	
Fall Wheat	27,628	19 7	544,271	3,351	31	103,881	
All Wheat	3,366,200	15 5	52,491,879	3,664,281	26 4	96,662,912	17 6
Oats.	2,064,114	30	62,034,668	2,121,845	47 7	101,077,991	28 0
Barley	1,187,136	20	23,866,098	1,039,849	34	35,281,095	38 6
Flax.	100,191	10	1,001,910	64,863	11 4	739,808	
Rye	10,138	17	172,326	16,699	21 8	364,572	
Peas	3,742	16	59,872	3,803	17	64,955	
	6,731,521		139,626,753	6,911,340		234,191,333	

This points out in a striking manner the substantial increase in yield this year. Wheat shows an average yield of 26.4 bushels as compared with 15.5 bushels in 1914, and as against 17.6 bushels of an average for the ten years previous. Oats averaged 47.7 bushels as compared with 30 bushels in 1914, and an average of 38.6 for the ten years previous. Barley averaged 34 bushels as compared with 20 bushels in 1914 and an average of 28 bushels for the ten years previous.

ASTOUNDING YIELDS OF WHEAT AND OATS

The Department of Agriculture, unfortunately, has been unable to obtain actual measurements of land and the grain therefrom to prove actual yields this season. Reports from the most authentic sources are in many cases astounding. Wheat yields averaging 40 bushels per acre for whole districts are not uncommon. Yields of 30 and 35 bushels per acre for a district are reported from every section of the province. Individual fields of summerfallow, potato land or breaking have been said to yield from 60 to 70 bushels per acre. Oats in several districts are said to have averaged from 80 to 100 bushels per acre.

These phenomenal yields can be attributed to no single cause. Many different reasons have been advanced among which there would appear to

be three or four of considerable importance. The first of these is the light crop of 1914, which left a great deal of nourishment for the crop of 1915. The second is that more land was well prepared for crop in the fall of 1914 than in any other fall in the history of the province. This certainly had a beneficial effect on the crop. A liberal rainfall in the month of June was also advantageous. Another reason suggested by close students of agriculture is that the wheat crop this year bore a wonderful bloom. Practically every cell of the wheat head was fertilized, and each head filled wonderfully well.

POTATOES AND ROOT CROPS

The season of 1915 was not the most favourable for the growth of root crops. The dry weather of July and August, following frost in June is accountable for the light yield. Potatoes show an average for the province of 114.8 bushels per acre in 1915, as compared with an average yield of 140.4 bushels in 1914. The acreage planted to root crops was practically the same during these two years.

FODDER CROPS

The gradual breaking up of the upland hay areas and the drying of lower hay lands is responsible for a substantial increase in the total area sown to tame grasses. Our crop

reports indicate that Western Rye grass and Brome grass are best meeting the needs of the live stock farmers of the province, Brome being particularly reliable as a pasture grass. Timothy is not rapidly increasing in favour in this province. All these crops show a slightly lower yield this year than in 1914.

It is particularly unfortunate that the corn crop this year must be reported a partial failure. The late spring frost in June and the early fall

frost in August were sufficiently severe to cut back the crop beyond recovery in many cases. The seriousness of this situation can be appreciated when it is noted that the area planted to corn had increased from 30,430 acres in 1914 to 52,713 acres in 1915. While the condition this year cannot fail to create disappointment among farmers regarding corn, this crop is so firmly established in many of the older districts that it will continue to increase in popularity.

SASKATCHEWAN

BY F. H. AULD, ACTING DEPUTY MINISTER OF AGRICULTURE

WITH a total wheat acreage of 6,884,874 acres, Saskatchewan in the past year produced over one hundred and seventy-three and a half million bushels of wheat with an average yield per acre of 25.2 bushels. The yield of oats is equally satisfactory, as 2,546,949 acres with an average yield of 45.9 bushels have yielded 131,000,000 bushels. There was a falling off in barley and flax as so much attention was paid to wheat, but nevertheless these two grains account for

an additional 15,000,000 bushels between them. Particularly in south-western and east-central Saskatchewan are the heavy yields noticeable, and this is the more remarkable as that area suffered so severely from drouth in the previous year. It is true that more attention was paid to cultural methods, but it also shows the great productiveness of Saskatchewan's soils. The following list shows some of the actual yields recorded.

NAME	District	Grain	Acreage	Average Yield	Total Yield
J. S. Bresnahan	Tompkins	Wheat	37	bus	bus.
F. R. Shortreed	Sceptre	"	72	48	1,776
P. Hopper	Abbey	"	80	60	4,320
J. P. Firnquist	Stone	Oats	7	61	4,860
E. A. Lipsit	Lancer	Wheat	10	116	812
J. Neigel	Prussia	"	420	57	570
A. A. Callanack	Portreeve	Flax	100	47 6	19,992
Jas Begley	Lemsford	Wheat	80	21	2,100
A. Anderson	Burgogne	"	60	54	4,382
H. Macey	Rosetown	"	110	43	2,580
J. C. Moore	Fiske	"	97	52	5,720
J. J. Strutt	Flaxcombe	Oats	10	50 05	4,855
J. G. Carruthers	Rosetown	"	15 5	100	1,000
				116	1,800

Instance upon instance such as the foregoing could be mentioned and it is not difficult to imagine the enormous amount of work that faced our threshermen in September last. Naturally, there is a considerable decrease in the acreage of land prepared for this year's crop as farmers were so busy threshing and hauling their grain to town, and these

features combined with the wet weather which delayed threshing and did not permit of fall ploughing being carried on, accounts for the decreased acreage.

The quality of the grain has been better than the average and the year was a very satisfactory one for Saskatchewan agriculturists.

ALBERTA

BY CHARLES S. HOTCHKISS, CHIEF PUBLICITY COMMISSIONER

ALBERTA has been the home of the ranching industry and it is only in recent years that any attempt on a large scale has been made to grow grain. Consequently the province does not show the same rapid development as Saskatchewan. Moreover on account of the province being admirably adapted to the production of live stock a large percentage of farmers are engaged in mixed farming.

The crop area, however, has increased from 591,614 acres in 1906 to 3,184,500 acres for the current year. With a total yield of 19,333,266 and 124,825,000 bushels respectively. Large as has been the development of the grain industry in Alberta, it is but a fraction of what is yet to come. The total area of our agricultural land being estimated at 100,000,000 acres, we have therefore only about four per cent of our arable land under cultivation.

The completion of the Edmonton, Dunvegan & B.C. Railway into the Peace River district this year opens up a very large crop producing area. We estimate that it produced not less than three million bushels of grain in 1915 and made its first exports over the new railroad line. The quality of Alberta's grain is too well known to need any reference here, as our wheat, oats, barley and flax have repeatedly won first place in world competitions.

A PHENOMENAL YEAR

During the past year our farmers responded to the Empire's call for "More and more production" in a manner which reflects credit not only on the farmers themselves but is a substantial indication of the productivity and fertility of our soil. Although the climatic conditions were favourable for crop production during the past season a splendid effort was made by our farmers to not only enlarge our crop area, but to increase live stock and all other productions. This effort resulted in producing what is perhaps the greatest grain crop ever grown anywhere. Alberta produced crops last year that have shown not only big yields but tremendous yields, yields that find very few parallels in the history of grain growing in any part of the world. Fifty and sixty bushels per acre were quite common, and in not a few localities seventy and even eighty bushels of wheat per acre are vouched for. Nor were these phenomenal yields restricted to any one district in the province, but were found from Fort Vermilion in the extreme north to the 49th parallel of latitude. Oats and barley exceeded one hundred bushels per acre, and all other cereals yielded in proportion.

Perhaps one of the most striking features of our 1915 crop production is to be found in the fact that corn

was successfully grown in various portions of the province, but more particularly in the south. Our demonstration at Medicine Hat produced 10.6 tons per acre from a twenty-four acre field, and many others in the same district did practically as well with this crop.

THRESHING CAPACITY TAXED

The extraordinary grain crop overtaxed the threshing machine capacity somewhat and a number of machines were imported from Manitoba and

close of navigation.

In order to verify the estimate of the extraordinary grain yields we have copied our threshermen's returns to date and find that the average per acre of the three leading cereals for the whole province stands as follows:-

Spring Wheat, 36.16 bushels; Oats, 57.33 bushels; Barley, 34.83 bushels.

The potato crop has increased in area about five thousand acres and produced an average yield of about



HAULING CORN TO SILO, DEMONSTRATION FARM, MEDICINE HAT, ALBERTA

Saskatchewan. While in a few cases considerable loss and inconvenience resulted, a very small portion of the grain crop still remains unthreshed. The transportation companies are all taxed to their utmost capacity; in fact are still unable to clear out our elevators, but they have succeeded in doing so well that but one branch line has suffered to any considerable extent. We fear, however, that our needs will greatly increase after the

200 bushels per acre. We estimate a total yield of 9,000,000 bushels, and for the first time in our history we are exporting potatoes as far east as Ontario. The quality of these potatoes finds for them an easy market almost anywhere.

The turnip and other root crops show a very large increase which on the whole places our harvest for the current year away and beyond all previous records.

BRITISH COLUMBIA

BY A. B. TWEDDLE, ASSISTANT STATISTICIAN

THIS province readily responded in 1915 to the slogan, 'Patriotism and Production', issued by the Federal Department of Agriculture, Ottawa, resulting on the whole in an increased area of field crops, and particularly in grains. Crop yields, production of live stock, and by-products, in most instances show an even greater proportionate increase.

Despite the fact that prices in all cases except cattle and fruits have ruled lower, and the production of swine, poultry, eggs, and vegetables was below 1914, the province is able to show an increase in the value of total production.

FIELD CROPS

Grains show a very substantial increase in area, while yields exceeded 1914 over 30 per cent. Although prices averaged 20 per cent lower than 1914, the total value is greater. The standard was excellent, due in no small measure to education among growers in proper seed selection and improved methods of cultivation.

Hay decreased somewhat in area, having given way to the increased area in grains, yet yields were above normal, and quality excellent, owing to ideal curing weather.

Prices averaged 14 per cent below 1914.

Vegetables varied little in area from 1914. Yields in the eastern sections were above normal, yet, owing to extremely dry weather during the growing period in the coast sections, and where 50 per cent of the production of the province usually occurs, yields were reduced over 40 per cent below normal, resulting in a decrease in the total production for the province.

FRUITS

The fruit crop stands prominent

as the most satisfactory one during 1915, for not only did orchard yields exceed 1914 by 10 per cent, but the value increased over 60 per cent, which is most encouraging to growers. Increased yields may be attributed to the extensive area of young orchards now rapidly coming into bearing, which comprises nearly 70 per cent of the total area.

LIVE STOCK

There has been a most satisfactory natural increase in all hoof stock except hogs, in which case, as well as that of poultry, large numbers were forced on a market at consequent low prices, owing to the prohibitive cost of feed during the earlier part of the year. Despite lower prices of all stock except cattle, the total value shows an increase over 1914.

Marked increased attention has been centred on both beef and dairy cattle, breeders aiming to increase their herds and improve the standard at every opportunity. Dairy cattle have increased in the year 35 to 40 per cent. Exceptional numbers of beef cattle have found their way to British Columbia markets, while a most favourable grazing season in range sections resulted, as pronounced by dealers, in a most excellent quality of beef.

IMPORTS

A point well worthy of note is a decrease of over 35 per cent in the value of agricultural food products imported into this province from other Canadian provinces during 1915, as compared with 1914, which represents a most important financial saving to British Columbia since imports from the above source amounted to some \$19,000,000.00 in 1914, and in no small measure brings before the people the real value of the slogan, 'Patriotism and Production', despite apparently discouraging prices.

ONTARIO

NOTES FROM DISTRICT REPRESENTATIVES

SUPPLIED BY C. F. BAILEY, B.S.A., ASSISTANT DEPUTY MINISTER OF AGRICULTURE

VICTORIA COUNTY

A. A. Knight, B.S.A.:—

"On Saturday afternoon the regular fall meeting of the Victoria Pure Bred Stock Association was held and arrangements made for the 1916 sale on the last Tuesday in January. Prospects are that prices will rule fairly high and there is good interest on the part of the contributors to the sale. Twenty-five males and ten females have been entered, as well as five Clydesdale horses. This is the first year that horses have been admitted to the sale and it is being tried as an experiment."

BRUCE COUNTY

N. C. MacKay, B.S.A.:—

"The Saturday previous the directors of our Stock Breeders' Club met in the office and we made arrangements for the holding of our sale in February or March. The date depends upon the Guelph one. Ours is to be the day following. A deposit of \$10 is to accompany the entries for horses and cattle, and \$5 for sheep and swine. All entries are to be in by January 15th. We sent out notices to all the breeders who might be interested, letting them know these facts and requesting that they let us know the number of animals they would be able to fit for the sale. In all we sent out 90 of these circulars and have already received the promise of about 15 animals."

NORFOLK COUNTY

Geo. Wilson, B.S.A.:—

"The Norfolk Holstein-Friesian Breeders' Club had a meeting in the board room on Saturday afternoon. The members decided to hold a sale of cattle early in the new year, the date to be arranged by the sales committee and made known at an early date. After much discussion it was decided to offer no bulls for sale. Bulls may be advertised in the catalogue for private sale. The number of animals in the sale was limited to 50, and the cattle are to be sold subject to the tuberculin test as formerly. It was further decided that the auctioneer's expenses should be divided pro-rata on the basis of prices realized and the other charges pro-rata on the basis of the number of head sold."

LAMBTON COUNTY

G. G. Bramhill, B.S.A.:—

"On Tuesday evening of this week I addressed a Farmers' Club at S. S. No. 6, Brooke township. This meeting was called for the purpose of discussing sugar beets as there is a possibility of a sugar beet refinery being established at Petrolia. From what I have observed in the practice of sugar beet growing I have no hesitation in advising farmers to grow sugar beets to the extent of ten acres on a farm of 100 acres. I point out in each case, however, the importance of live stock and the proper rotation of crops in conjunction with sugar beet growing."

SIMCOE COUNTY

J. Laughland, B.S.A.:—

"The milk testing demonstration held in connection with Allenwood Farmers' Club on Tuesday was very successful. Mr. Elliot and I arrived shortly before two o'clock, the hour of meeting, and found quite a number of farmers already present with their samples of milk. After a short explanatory address we put the two testers into operation, the one holding eight bottles and the other four and were kept until after five o'clock making tests and answering questions."

HALTON COUNTY

H. R. Hare, B.S.A.:—

"During the week, I have established three poultry breeding stations from which we may secure eggs for the school work during the coming year. The class of stock secured is of the very best coming either from Guelph stock or from Guild's stock at Rockwood. I am sending away for cockerels for these breeding stations, which are being supplied by the Guelph Poultry Department. In all I expect to have about 175 hens from which we may draw eggs during the breeding season next year. I feel sure that through these we can get much better results from the hatches as the flocks are very small."

WENTWORTH COUNTY

R. L. Vining, B.S.A.:—

"I have noted with interest the reports on corn from some of the variety tests in other counties. It may be of interest to add a statement from our annual report regarding the test in this county. Taking the average of four plots which are fairly uniform we find that the results are as follows:—

Variety	Tons per Acre
Wisconsin No. 7..	20 7
Bailey.....	20 5
Compton's Early	18.4
Golden Glow	17.5
Longfellow..	17 4
Salzer's North Dakota.	16 4
White Cap Yellow Dent	15.7

"It would appear that from a fodder standpoint Bailey and Wisconsin No. 7 are about equal, outyielding any of the others. Both are late varieties but matured sufficiently to make good ensilage this year.

"Golden Glow made a very favourable impression. It stood fourth in yield and was eight or ten days earlier than Bailey or Wisconsin No. 7.

"White Cap Yellow Dent which is grown by many farmers gave the poorest yield. This may have been due to a low vitality of the seed, which may not occur another season. The stand, however, this year was uniformly poor in all plots"

PRINCE EDWARD COUNTY

A. P. MacVannel, B.S.A.:—

"In the summer of 1914 Mr. Carman Metcalfe, Cherry Valley, one of the enterprising farmers of this county, built a concrete manure pit, the particulars of which are rather interesting. For some time previously Mr. Metcalfe had been aware that he was suffering some loss due to waste on account of the manure lying exposed in the yard, but was somewhat at a loss as to how to eliminate it. At our suggestion he finally decided to build a concrete manure pit 16 feet in diameter, 2½ feet deep, with walls 1 foot thick, and a concrete floor, with the floor and walls plastered to make it waterproof. The following is an itemized account of the cost:—

Four barrels cement at \$2	\$8.00
Two loads gravel at 15c.	.30
Hauling gravel and stone.	3.50
Hauling silo rings.	2.00
One man 1 day at \$2.50.	2.50
One man 1 day at \$2.00.	2.00
	<hr/>
	\$18.30

"Mr. Metcalfe is more than delighted with the results. It holds about 25 tons of manure, thus it is only necessary for him to have it drawn out once a month, and one man with a team will do this in a day. He has never found any of the manure burned by overheating, nor has it ever been frozen so that it could not be removed, even when it was 30 degrees below zero. He considers that it pays for itself at least once a year, in fact he thinks it paid for itself during the past summer. In connection with this he said, 'Before we had the pit the manure which was made during the summer was dumped out on the yard, and in the fall it couldn't be found. This year we drew enough manure out of the pit to pay for it. Before, the liquid manure was all lost, but by having the pit it was all saved. Some of the neighbours said I should have made it square and with a door so that the waggon could be backed in, but if I had done this the liquid manure would have been lost, and besides, there isn't much to be gained by backing the wagon or sleigh in when you can drive all around it.'"

DUFFERIN COUNTY

H. A. Dorrance, B.S.A.:—

"I might state that I submitted to the County Council a statement of our work for the year and I note that after a consideration of the report a resolution was passed appreciative of our work and especially noting the work in connection with the rural school fall fairs."

MANITOULIN

I. F. Metcalf, B.S.A.:—

"On Saturday a director's meeting of the Manitoulin Marketing Association was held in this office to wind up the business for the year. Approximately \$25,000 worth of wool and live stock were sold by the Association during the year."

TORONTO

C. F. Bailey, B.S.A., Assistant Deputy Minister of Agriculture:—

"The following statement will serve to give some idea of the development of the school fair movement in Ontario. These figures are for 1915 and have been secured from the records kept by each District Representative throughout the province:—
No. of Fairs, 234; No. of Schools, 2,291; No. of Pupils, 48,386; No. of Plots, 51,243; No. of Settings of Eggs, 6,868; No. of Children, 72,860; No. of Adults, 84,406; No. of Entries, 116, 236."

DISTRICT REPRESENTATIVE LEAFLET

THE Ontario Department of Agriculture, through their district representative service, have undertaken a further step in making available to the farmers the most advanced agricultural information. Commencing in November the district representative in Dundas county began issuing to young men who had attended four weeks' courses in agriculture, periodical leaflets on seasonable farm topics. The leaflets, which are termed "Short Notes for Increased Farm Revenues," are issued twice monthly, and deal with such topics as the preparation of sprays for various purposes, sources of information on various farm topics, sources of seed grain and other seasonable suggestions. The first number, which was issued

on November 15th, recommended the keeping of herd records and advised what outfit was necessary and sources of supply, together with evidences of the value of herd testing. Recommendations with respect to the storing of machinery were also given as well as a number of poultry pointers, which recommended the cleaning and spraying of poultry houses.

The leaflet of December 1st dealt with live stock feeding and agricultural meetings. In the latter the young men are recommended to attend, in addition to meetings in the district, the Ottawa Winter Fair, which, it is stated, will prove an inspiration and emphasize the dignity of the agricultural occupation and its importance to the country.

INTER-COUNTY LIVE STOCK JUDGING COMPETITION

BY C. F. BAILEY, B.S.A., ASSISTANT DEPUTY MINISTER OF AGRICULTURE

FOR the past few years the Department of Agriculture for Ontario has been conducting four to six weeks' courses in agriculture for farmers' sons in the counties where district representatives have been established. During the months of January and February, 1915, 43 courses were held with a total attendance of 1,114. These courses are arranged primarily for farmers' sons ranging in age from 16 to 25 and are conducted by the district representatives, who are assisted to some extent by speakers supplied by the Department. Various lines of agricultural work are taken up, including live stock, which is a very important feature and is greatly appreciated by the young men taking these courses.

With a view to further stimulating an interest in live stock and a friendly rivalry between the counties,

the Department through co-operation with the Boards of the Eastern and Western fairs succeeded in arranging for an "Inter-County Live Stock Judging Competition" to be held in connection with each fair. For this purpose the province has been divided into two districts, namely, Eastern and Western Ontario. Counties in Western Ontario are to meet at the Guelph Winter Fair and the Eastern counties at the Ottawa Winter Fair.

Each county is represented by a team of three young men, 25 years of age or under, who have taken a course in agriculture under the district representative. They are required to judge two classes each of heavy horses, beef cattle, dairy cattle, sheep and swine. Twenty minutes are allowed for placing the animals in each class and writing reasons. Competent judges are

secured to select live stock for each class and examine the papers. Sixty per cent is allowed for correct placing of the animals and forty per cent for perfect reasons. Liberal prizes are offered for each class and to the team having the highest total score silver medals will be awarded in addition to a handsome silver trophy. The trophy going to the winners at the Winter Fair at Guelph was donated by the Honourable



CUP FOR INTER-COUNTY JUDGING
COMPETITION

James S. Duff, Minister of Agriculture for Ontario, and for the Ottawa Winter Fair by Mr. Peter White, K.C., of Pembroke, Ontario. In each case these trophies will be competed for annually and must be won three times before they become the property of any one county.

At the Winter Fair recently held at Guelph this competition proved to be a very important event. Fifty-

four bright young men, representing 18 counties in Western Ontario, met in the Live Stock Arena for the purpose of competing in this competition. A great deal of interest was shown, not only by the young men themselves, but by the people on the ring-side as well. Not only that, but the farmers throughout the whole province took very great interest in the competition and rendered valuable assistance in training the young men for this work. Each team showed evidence of having given the question careful study and made a creditable showing.

The cup was won by Oxford county, but, strange to say, none of the members of this team succeeded in carrying off any of the prize money. This was due to the fact that the team proved to be good average judges in all classes of live stock yet not outstanding in any one. Some of the other teams succeeded in winning one or two prizes, but one or more members of each of the teams fell down badly in some class of live stock, which affected the aggregate of the score very materially. This would seem to indicate the importance of having a team well trained in all classes of stock rather than placing dependence upon one or two members of the team who happen to be exceedingly good in one or two classes of stock. Lack of knowledge of the other classes may mean the difference between success and failure.

The following statement taken from the Guelph Winter Fair premium list will give a clear and definite idea of the nature of the competition and the prizes offered:—

INTER-COUNTY LIVE STOCK JUDGING COMPETITION

In order to encourage a deeper interest in Live Stock on the part of the young men of the province, the Winter Fair Board has inaugurated a special competition to be open to one judging team from each county. These teams must be selected by the district representative from those who have attended a four to six weeks'

course in agriculture and who have never taken a regular course in an agricultural college. The young men must be under twenty-five years of age and three will constitute a team.

Aside from the honor, the prizes are most substantial and should arouse the keenest competition.

PRIZES ARE AS FOLLOWS

(1) To the team winning the greatest number of points, a handsome silver trophy has been donated by Hon. J. S. Duff, Minister of Agriculture for Ontario, and to each member of the winning team a silver medal. The trophy will be competed for annually, and must be won three years in succession before it becomes the property of any county. Headquarters for the trophy will be the district representative's office.

(2) The following individual prizes will be offered, but no competitor will be given more than two prizes:—

Sec.	1st	2nd	3rd	4th	5th	6th
1. Horses	\$10	\$9	\$8	\$7	\$6	\$5
2. Beef Cattle	10	9	8	7	6	5
3. Dairy Cattle	10	9	8	7	6	5
4. Sheep	10	9	8	7	6	5
5. Swine	10	9	8	7	6	5

(3) Members of the team competing this year, will not be eligible to compete in this competition in succeeding years.

(4) An entry fee of \$1.00 will be charged each member of the team.

(5) Entries will be received at the office of the Secretary up to and including Friday, November 19th.

The same prizes will be given at Ottawa and the same rules as governed the competition at Guelph will apply to the competition to be held at the Ottawa Winter Fair in January. Although it is not definitely known at the present moment just how many counties in Eastern Ontario will enter the competition at Ottawa, present indications would seem to show that it will prove to be a very important feature of the fair.

The Inter-County Live Stock Judging competition is undoubtedly one of the most important features adopted by the Eastern and Western Winter fairs for sometime and will assuredly have a telling effect, not only upon the young men who take part in these competitions, but upon the general welfare of both these very important institutions.

THE DAIRY SCHOOL, ONTARIO AGRICULTURAL COLLEGE

BY H. H. DEAN, B.S.A., PROFESSOR OF DAIRYING

THE Dairy School in connection with the Ontario Agricultural College, was established, and the first course held, in 1893. The prime causes for its coming into existence were the growing importance of the dairy industry in the province and the need for more scientific instruction, particularly with reference to the testing of milk with the Babcock test, which had recently been introduced into Canada from the United States.

Provision was made for the accommodation of fifty students at the first session, but there were over one hundred applications. Among these were some of the most prominent dairymen of that time. The instructors were Messrs. A. T. Bell and T. B. Miller in cheese making,

T. C. Rogers, buttermaking, F. B. Linfield, cream separators W. J. Palmer, milk testing, and the writer as lecturer and superintendent of the school

The following year a new building was added to the equipment. Accommodation was provided for 100 students and was fully taken up by the classes of that year.

Since then a course has been held each year making altogether twenty-three courses, with an average attendance of about 100 each year.

From time to time, other courses than the regular or long course, have been added until during the winter of 1915 there were held four different courses—one of about three months for factory men and farm dairy men

and women, these running concurrently in the months of January, February and March; one each for ice-cream, and cow-testing concurrent during the last week in March; and one for dairy inspectors and instructors during the first week in April. The total registration in these courses was 128. For 1916 there will be added a special course in soft cheese-making.

MORE ACCOMMODATION NEEDED

Those in attendance at the school in later years have usually been younger men, men with less dairy experience, and largely from Western Ontario. Because the students are less mature it has been suggested that the course should be one of two terms of three months each, devoting more time to practical work



ONTARIO AGRICULTURAL COLLEGE DAIRY SCHOOL

Main building containing class-rooms and butter-factory; building on right contains cheese-factory and power plant

STAFF OF INSTRUCTION

The present staff comprises the following:

- H. H. DEAN, B.S.A., Professor of Dairy Husbandry.
- R. HARCOURT, B.S.A., Professor of Dairy Chemistry.
- A. L. GIBSON, B.S.A., Lecturer in Dairy Chemistry.
- D. H. JONES, B.S.A., Professor of Dairy Bacteriology.
- T. H. LUND, B.S.A., Lecturer in Dairy Bacteriology.
- T. J. MCKINNEY, Instructor in Cheese Making.
- W. H. SPROULE, Instructor in Milk Testing.
- G. TRAVIS, Instructor, Hand and Power Cream Separators; also in Boiler Engine, Piping, Soldering, etc.
- D. McMILLAN, Instructor in Ice Cream Making and Butter Making.
- MISS BELLE MILLAR, Instructress in Farm Butter Making and Farm Dairy, Soft and Fancy Cheese Making.
- J. B. SMITH, Instructor in Hand Separators and Milk Testing, Farm Dairy.

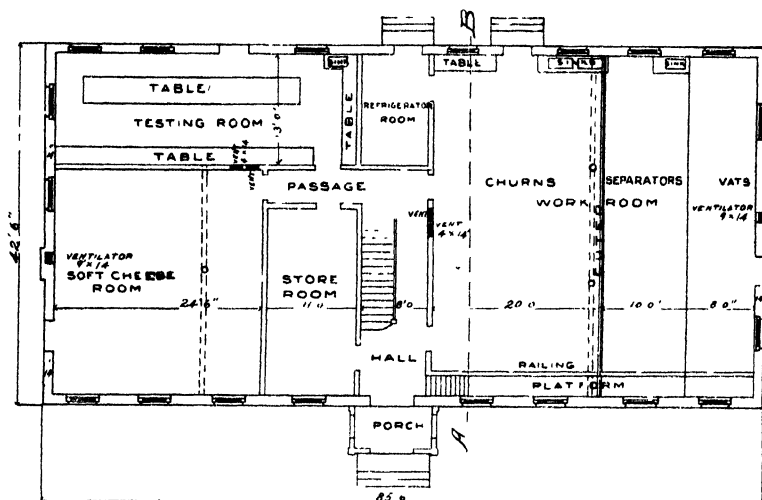
in the dairy and to laboratory work in dairy chemistry and dairy bacteriology. Before this could be done we should need double our present accommodation, as our building and equipment are taxed to their utmost capacity at present, so much so that no work in dairying can be given to the regular college students after the New Year, except a very limited amount to the dairy graduating class. Even they are almost entirely crowded out, during the time the short courses are given. We are also unable to take up such important lines as milk condensing, dairy refrigeration, town and city milk and cream trade, utilization of dairy by-products, etc., for lack of room and equipment.

ORDER OF STUDY

The main objects of these dairy courses are to give in a short time

as much knowledge as possible of the science and practice of dairying, by lectures and by means of practical work. The danger lies in crowding too much into a short period, whereby students have not a full grasp of

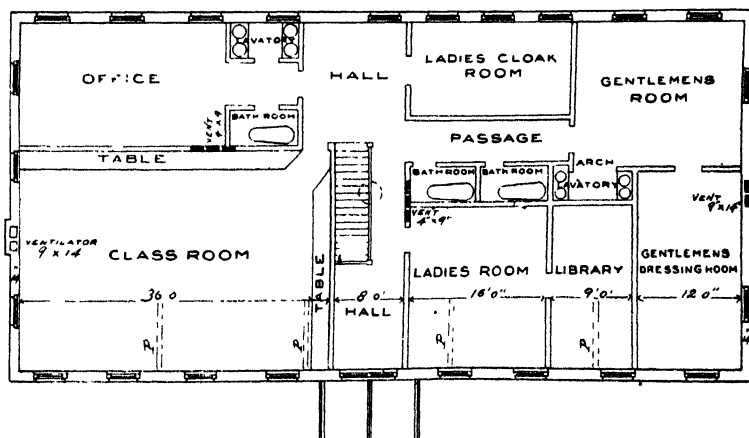
polished from the brain. They may be good practical men in the factories and on the dairy farm but cannot lay hold of scientific truth as applied to the dairy business. A great number are weak in mathematics and are



PLAN OF GROUND FLOOR

the principles and best practices of dairying. The knowledge tends to be too superficial. Many students do not know how to study when they enter the school and require nearly three months to get the mental rust

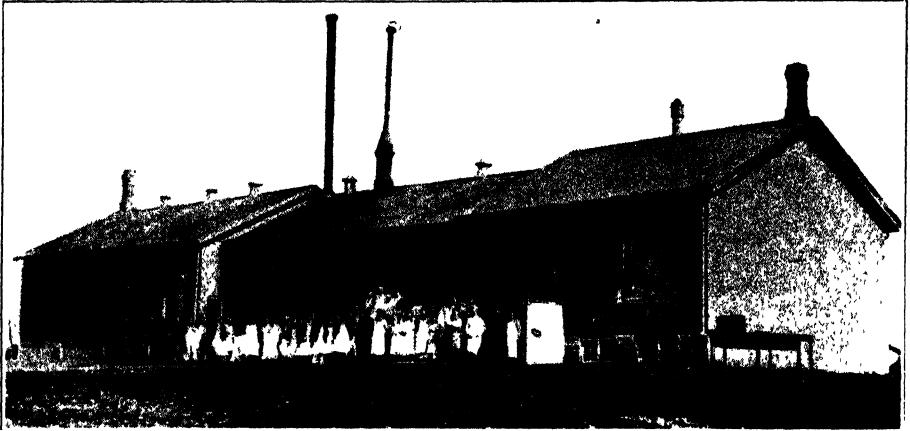
unable to apply the principles of testing milk and cream to factory and farm work. It is one thing to know how to test milk and cream, and another to apply this knowledge to cows and other dairy problems on



PLAN OF UPPER FLOOR

a farm, or to the business of patrons of a factory. This requires mathematical training, which a number of students do not have, and the time given to this work is too short.

advancing the dairy industry of the province of Ontario, the time has come when a distinct advance should be made and more thoroughness in training should characterize future



THE ONTARIO AGRICULTURAL COLLEGE DAIRY SCHOOL IN 1893

Superficiality is all too common in our methods of education in Canada. As a rule, we lack the thoroughness which characterises education in European countries. While the dairy schools have done excellent work in

work in the education of dairymen in Ontario. This will require more time than is now given and better equipment than is to be found in any of the schools of dairying either in Canada or in the United States.

THE EASTERN DAIRY SCHOOL, KINGSTON, ONTARIO

BY L. A. ZUFELT, SUPERINTENDENT

THE Eastern Dairy School was built and equipped in 1894 by the College of Mining and Agriculture, affiliated with Queen's University. Arrangements were made with the Dominion Department of Agriculture to have the school conducted by the Dominion Dairy Commissioner, which position was then held by Professor Jas. W. Robertson. Mr. J. A. Ruddick, the present Dairy and Cold Storage Commissioner, at that time a member of Professor Robertson's staff, then became its first superintendent after planning and supervising the

equipment. Two years later the school was handed over to the Ontario Department of Agriculture and Mr. Ruddick's services as superintendent were retained by the Provincial Department. In 1898 Mr. Ruddick resigned to accept the position of Dairy Commissioner for New Zealand and Mr. J. W. Hart, B.S.A. became his successor, to be followed in 1903 by Mr. J. W. Mitchell, B.A., now Professor of Dairying in the Manitoba Agricultural College. In 1908 Mr. Mitchell resigned to accept his present position and Mr. G. G. Publow became superintendent,

which position he filled until 1911, when the present superintendent Mr. L. A. Zufelt was appointed.

The building has been enlarged and remodeled several times in order to accommodate the constantly increasing number of students and to keep it in line with modern developments in the dairying industry.

Since the opening of the school in the autumn of 1894 some 2,500 students have been registered.

COURSES OFFERED

The courses offered to students during the school year are as follows:

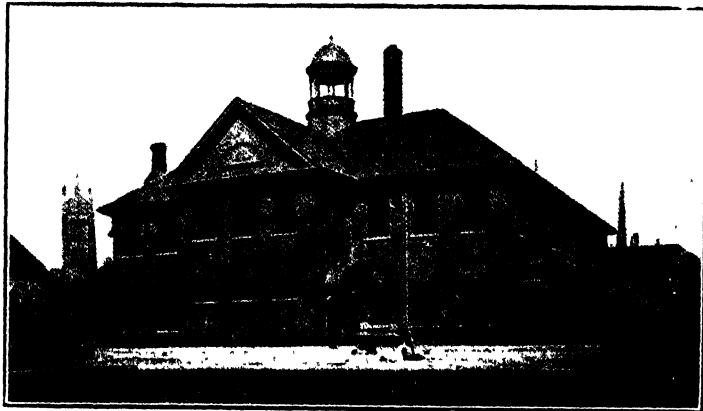
to 74 per cent will be given second class honors, and those averaging 75 per cent or over first class honors.

Instructors' Course.—The closing course of the session will be the Instructors' Course, for which none but prospective instructors will be accepted.

Short Courses.—No special short courses will be given, but those wishing to attend the School for a short period may enter at any time, and stay as long as they desire.

CERTIFICATES

In order to obtain a certificate from



THE EASTERN ONTARIO DAIRY SCHOOL

The Regular Long Course.—Opens on Monday, January 31st, and closes Thursday, March 23rd. This course covers comprehensively all the practical and scientific phases of the manufacture of dairy products.

At the close, written and practical examinations will be held, embracing the following subjects:

Dairy Lectures; Cheese-making; Separators and the creaming of milk; Butter-making; Milk Testing; Dairy Bacteriology; Dairy Chemistry; Miscellaneous Subjects.

Candidates for certificates must obtain at least 33 per cent of the marks in each examination subject and 45 per cent of the total. Those who secure an average of 60 per cent

the Eastern Dairy School, it is necessary to take the entire course, pass the prescribed examinations, both written and practical, have at least six months' experience in a cheese factory or creamery before taking the course, and, later, by giving proof of ability to successfully manage a factory or creamery, by having at least one season's experience as a manager, after passing the required examinations.

Each applicant for a certificate will be visited during the factory season, and he and his work reported upon by some person selected for this purpose by the superintendent of the school.

TERMS OF ADMISSION, FEES, ETC.

No entrance examination is required, but students are expected to have at least one season's experience in a cheese factory or creamery before entering the school.

TUITION

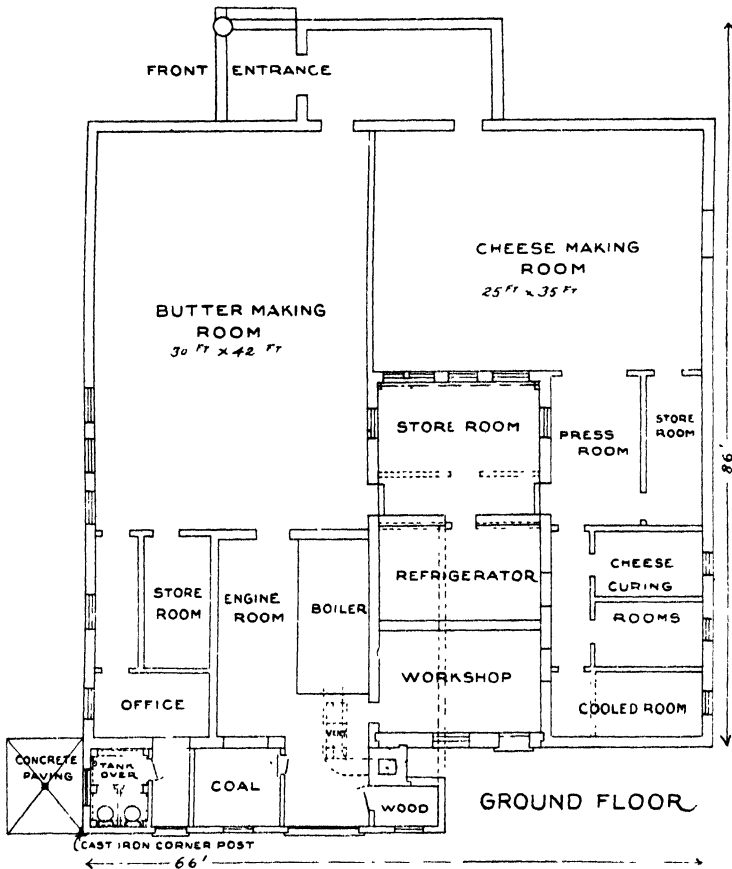
Tuition is free, the only fees collected being the following:

fee of \$1.00 to cover the cost of same.

The Instructors' Course is exempt from class fees. This course is open to Instructors only.

THE SESSION OF 1915

The attendance at the school for the session of 1915 was as follows:



PLAN OF GROUND FLOOR

Registration fee of \$1.00. Students non-resident of Ontario are charged a fee of \$5.00. A deposit of \$1.00, to cover possible fines and breakages, is returned in full if there is nothing charged against it. The school supplies students with clean aprons and caps and charges a

Eleven weeks' course for cheese and butter-makers.....	49
One week's course for Eastern Ontario instructors.....	21
Total.....	70

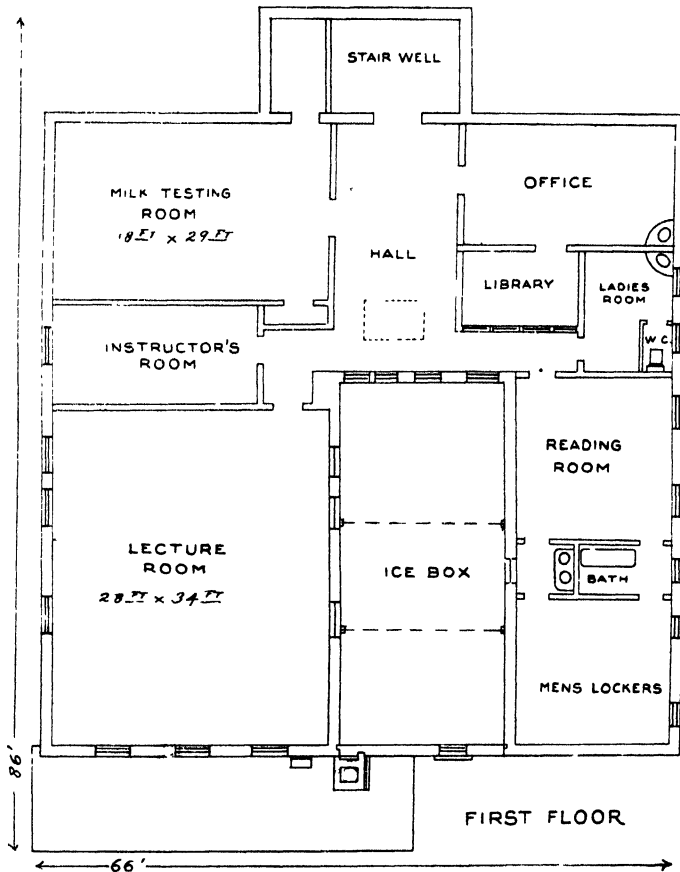
The nature of the work taken up with the students varies but little

from year to year, except in so far as is necessary to keep in touch with new ideas or methods which may be of benefit to the dairy industry. Briefly an endeavour is made to give each student a thorough grounding in the principles underlying cheese and buttermaking so that they may do their work more intelligently. Milk,

theory is accepted that is not capable of being put to practical application.

For demonstration purposes, upwards of 75 000 lb. of milk and 55,000 lb. of cream were manufactured into cheese and butter respectively.

During the balance of the year a model creamery is maintained and operated in connection with the



PLAN OF FIRST FLOOR

the raw material from which all dairy products are produced, is discussed at length, as it is realized that in order to produce the highest possible grade in the finished product we must have a thorough knowledge of the raw material from which it is made. In a word, our students are taught the reason "Why?" and no

school for the benefit of the dairy farmers in its immediate vicinity. It is run on strictly business principles and at the same time demonstrates to the creamery men at large what may be accomplished by having a high ideal and constantly endeavouring to attain this ideal. No soliciting is done for the cream sup-

ply, but on the contrary patrons may send cream as long or short a time as they wish so long as they conform to the other requirements demanded by the management.

difficulty is met with in selling the same at from 2c. to 4c. per pound above the regular market quotations.

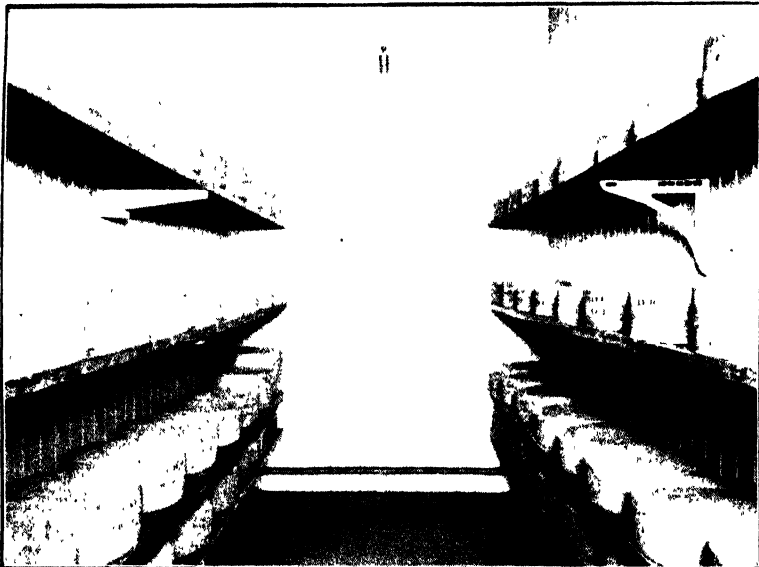
A limited amount of experimental work is undertaken as well, but as



PRINTING AND WRAPPING BUTTER, BUTTER-MAKING DEPARTMENT

As all the cream is delivered practically sweet the quality of the butter has won such a reputation that no

the equipment is hardly suitable for work of this nature more attention is given to practical results and much



ONE OF THE CHEESE CURING ROOMS

information is obtained which in turn is imparted to the students during the school term.

The following is a summary of the output of the creamery for the year 1914:

Total lb. of butter made for the year ending December 31st, 1914...	130,400
Total amount received for the sale of same	\$35,785 06
Total sales of cream	1,055 94
Total sales of buttermilk	455 35

Percent of over-run	20 5
Average selling price per pound of butter	27 44
Average price per pound of fat to patrons...	30 55

Prices paid patrons in 1915 after deducting 3½ cents per pound of butter for cost of manufacture:—

April,	.37	c. per lb. of fat
May,	.35	6c. " "
June,	.34	6c. " "
July,	.35	7c. " "
August,	.35	9c. " "
September,	.36	5c. " "

QUEBEC

APPLE BOX COMPETITION AT THE OKA AGRICULTURAL INSTITUTE

ON the 20th of October last, the students of the Oka Agricultural Institute had an occasion to show their ability as fruit packers. Rev. Father Leopold's annual special course in apple box packing ended by a competition. Valuable prizes had been generously offered which contributed to make the competition very keen. The first was presented by the Minister of Agriculture for the province of Quebec, the Hon. J. E. Caron. Many other prizes were offered by prominent members of the Pomological and Fruit Growing Society of the province and friends of the institution.

The Dominion Fruit Commissioner, Mr. Don. Johnson, acted as judge with the assistance of Mr. Philippe Roy, B.S.A., from this Institute. Mr. Johnson, as he afterwards explained, gave the most severe test to the competitors by opening the boxes by the side instead of the cover. This was, therefore, a strictly commercial test.

After three hours of hard work, the judges arrived at the following decisions: -

MAXIMUM: 100 POINTS

1	Xavier Rodrigue	96
2	Roméo Cossette	90
3	-Alphonse Lafrance.	89
4	Arthur Tremblay	88 5
5	Bernard Baribeau	88
6	-Albert Doyon	87 5
7	Elzéar Roy	86 5
8	Albert Héroux	86
9	-Albert Plante	85 5
10	Joseph Reddy	85
11	Lorenzo Hamelin	84
12	-Gustave Mongeau	83 5
13	Emile Lemire	83 3
14	-Conrad Meunier	83
15	-Edouard Bienvenue	81
16	Emile Gosseiln	80
17	-Ernest Pintal	78
18	Paul Brunel	76
19	-Albert Berthiaume	68

The points allotted were divided as follows:

1	Fruit: Size	10
	Colour	20
	Uniformity	20
	Quality	15
2	Pack: Appearance	5
	Bulge	10
	Solidity	10
	Alignment	10
	Total	100

After the awarding of prizes, Mr. Johnson congratulated the competitors and their professor on their excellent work, saying that this was

the best competition in apple boxing that he had seen. The boxes were well and so uniformly put up, he added, that it cost him much labour to establish the difference between the first, second, third, fourth, etc., prizes. The same man could not have done more uniform work.

The Fruit Commissioner also made another statement that made the boys feel proud of their College. He said that the best apples at the world's Fair at San Francisco were the Canadian Fameuse apples and that the best Fameuse had been supplied by the Oka Agricultural Institute.

THE DAIRY HERD AT STE. ANNE DE LA POCATIÈRE

BY PROFESSOR PASQUET, PROFESSOR OF ANIMAL HUSBANDRY

THE school of Agriculture of Ste. Anne de la Pocatière is the oldest of the schools of this kind in Canada, having been established in 1859. It has also occupied a prominent place in the breeding of dairy cattle. As early as 1860, the School of Agriculture had a splendid herd of registered Ayrshire cows, and we have kept the records of the remarkable yields of some cows in this herd.

This herd, continually improved by the introduction of bulls imported from Scotland, remained one of the best in the country until 1906. At that time, tuberculosis was introduced and caused dreadful havoc. Seventy-five cows had to be slaughtered. Since then, the struggle against this terrible disease which has necessitated all our efforts, has been brought to a successful conclusion.

During this period, the herd has improved only very little as the best dairy cows were attacked by the disease—those that were weakened by an abundant flow of milk.

To-day, the herd of pure bred Ayrshires includes twenty-five cows, twelve heifers and ten heifer calves. We are also establishing a herd of Canadian cows and we have a herd of grade cows which we intend to improve by continuous mating with a pure bred Canadian bull. Actually, the entire herd includes fifty milch cows, twenty-two heifers and twenty-one heifer calves.

METHOD OF TREATMENT

Since the disease has been eradicated a methodic plan has been followed. A description of this system may serve as an answer to the questions of THE AGRICULTURAL GAZETTE, published on p. 948, vol. 2.

1. Only the following cows are used for breeding for the maintenance of the herd: Cows (a) pure bred or high grade; (b) robust, of strong conformation, with wide open nostrils and with a long, deep and wide chest; (c) never having reacted to the tuberculin test; (d) giving at least 4,000 lb. of milk per year and 160 lb. of butter fat. This ideal of production will be increased for each successive generation; in a few years from now, only those cows that qualify for the Record of Performance, will be used for breeding—that is, Canadian cows giving, at the first calving, 4,400 lb. of milk containing 190 lb. of butter fat and Ayrshire cows giving, at the same age, 5,500 lb. of milk and 198 lb. of butter fat.

2. The bulls are selected particularly among the strongest, and preference will be given to those whose ancestors are entered in the Record of Performance. Of course, they will have to be recorded in the Herd Book of their breed.

3. Heifer calves shall receive whole milk for a month, then plenty of skimmilk, with a supplement of grain or starch.

Well developed heifers will be made to calve at two and a half years of age, so that they may be trained to give plenty of milk while their body is not completely formed and while the tissues are still supple.

never less than ten months.

4. The improvement in the system of culture will enable us to give the cows a complete, well-balanced and economical ration; in summer, the basis of the ration will be pasture



PROFESSORS OF THE NORMAL SCHOOL AND INSTRUCTORS OF THE SCHOOL OF AGRICULTURE, STE-ANNE DE LA POCAITIÈRE, QUEBEC

The udder will be developed by (a) thorough milking; (b) cross-milking; (c) milking three times a day, at least during two months after the first pregnancy; (d) furthermore, the first period of lactation will be made as long as possible,

and green fodder; in winter, hay and roots. There are now sixty-five arpents of hoed crops and it is intended to have one hundred. The area in green fodder which is already quite large, will be greatly increased during the coming years.

SASKATCHEWAN

FARM BOYS' CAMP

IN the August number of THE AGRICULTURAL GAZETTE, on page 786, under the heading "Recent Educational Methods," reference is made to a farm boys' camp that was held at the Regina Exhibition. Mr. D. T. Elderkin, manager of the Regina Exhibition Association, reports that it is the intention

to make this camp an annual feature of the exhibition and to increase the number in attendance as rapidly as possible. Suitable accommodation can be provided for about fifteen hundred boys and this number is expected to attend within a few years.

The camp of 1915 lasted for three

days and during that time the boys were given a number of demonstrations as well as practical experience in the judging of various classes of live stock, grain, and the identification of weeds. They were also permitted to watch the live stock judging and to examine exhibits in various departments. Certain hours were set aside for recreation and the boys were permitted to take part in outdoor games. Three days were found much too short a time and the hope is entertained that the camps, in future, will be continued for five or six days.

Mr. Elderkin states that the boys who attended the first camp this year will not be permitted to attend another camp, but that it is the intention of the Association to keep in touch with the boys that have attended, through various com-

petitions. With the co-operation of the provincial Department of Agriculture and the Saskatchewan College of Agriculture, each boy who was at camp in 1915 will, during the coming spring, be supplied with a bushel of good seed grain which he will be asked to sow and care for in accordance with instructions. Next summer prizes will be offered for sheaves of grain from plots thus sown, and in the following years the boys will also be asked to exhibit grain from the previous year's crop. Generous prizes will be offered for individual exhibits, and it is anticipated that a group competition for the boys from the different municipalities will be held and as prizes, pure bred males of different kinds of live stock will be offered. As time proceeds field crop competitions and other work of educational value will be taken up.

BRITISH COLUMBIA

REGISTERED SEED DISTRIBUTION

FORMER efforts of the provincial Department of Agriculture to supply registered seed of the stable mixed farming crops at the lowest possible cost having proved successful, it has been determined to continue the policy. Circulars have been issued to secretaries of Farmers' Institutes announcing the fact and giving the conditions, which are as follows:

RULES AND REGULATIONS GOVERNING 1916 SEED DISTRIBUTION

1. That certain registered seed varieties will be offered for crop improvement as follows: -

- (a) Registered Marquis or Red Fife wheat, not more than four bushels to one member at 3c. per pound.
- (b) Banner or Garton's No. 22 oats, not more than six bushels to one member at 2½ and 3c. per pound respectively.

- (c) Corn of one of varieties listed below, not more than 3 pounds to one member at 5c. per pound: Minnesota No. 13, Northwestern Dent, Longfellow, Wisconsin No. 7, Quebec No. 28.
- (d) Sludgstop mangel seed, not more than five pounds to one member at 30c. per pound.
- (e) Alfalfa seed northern grown, not more than five pounds to one member at 20c. per pound.

2. That registered seed will be offered for general seeding in larger quantities than the above at: wheat, 3c. per pound; oats, 2½ and 3c. per pound; corn, 6c. per pound; mangels, 30c. per pound; alfalfa, 30c. per pound.

3. That if sufficient seed of the desired grade cannot be secured to fill all applications, applicants will be notified and their money refunded before January 31st, 1916.

4. That in the event of a seed shortage, after the seed for crop improvement has been allotted, the applications for seed for general seeding shall be filled in the order received by the department.

5. That the Department of Agriculture does not purpose distributing seed as a commercial enterprise, and accordingly where the money paid for the seed by the farmer exceeds the actual cost of the seed to the Department, a refund will be made.

6. That the Department of Agriculture does not purpose to carry on this branch of the work indefinitely, and urges the farmers to familiarize themselves with the practice of seed selection.

7. That in view of the above, all members securing registered seed from the Department of Agriculture shall upon application, be recommended by the Department for membership in the Canadian Seed Growers' Association.

8. That all applications for seed shall be delivered to the secretary of the local Farmers' Institute before December 7th, 1915.

9. That the secretary of the local Farmers' Institute shall countersign all applications for registered seed submitted by the members, and forward same to Soil and Crop Division, Live Stock Branch, Department of Agriculture, Victoria, B.C., before December 18th, 1915.

10. That cash accompany all applications.

11. That the Department shall pay all freight charges to nearest shipping point of purchaser.

A supplementary circular states that the Department will supply

free of charge to two members of any Institute, one pound each of Minnesota No. 13, Longfellow, Northwestern Dent and Quebec No. 28, providing the applications are endorsed by the institute and the said members will agree to submit careful reports on the growth characteristics of the four varieties of corn as grown under the same conditions.

A further announcement is to the effect that provincial seed fairs will be held at Armstrong on January 19 and 20, and at New Westminster on January 26 and 27, 1916. Prizes amounting to upwards of \$400 are offered for wheat, oats, barley, field peas, fodder corn, potatoes, alfalfa seed, alsike seed, red clover seed, timothy seed, potatoes grown by boys and girls, registered white oats, registered spring wheat and registered potatoes. Exhibits must have been grown by exhibitors in 1915. A bonus of \$5 will be given to a first prize-winning exhibitor whose exhibit was entered in the field crop competition. The Department will pay for the transportation of the exhibits, but they become the property of the Department.

If this great heritage is to be transmitted unimpaired to succeeding generations of Canadians, we must improve our methods of farming and follow the example set by other countries from whom we have now much to learn. Good land will support a dense population and can be made to do so without losing its fertility, but only by intelligent and intensive cultivation. The greatest farming community in the world is that which lives on the rich delta lands of southern China. Prof. King, of the University of Wisconsin, who, when in China made an exhaustive study of the methods of farming there adopted, has reported that these people have, during the long series of centuries in which they have tilled the land, developed such a perfect system of agriculture that he could see no way in which western science could materially aid them. Through these long ages while they made the land yield enormous crops, they have maintained its fertility. - *Dr. Adams in address before Royal Society of Canada.*

PART III

Rural Science

ELEMENTARY AGRICULTURAL INSTRUCTION

A REVIEW AND FORECAST

PRINCE EDWARD ISLAND

BY W. R. REEK, B.S.A., DIRECTOR OF AGRICULTURAL INSTRUCTION

SCHOOL gardening and the carrying on of the Home Project idea met with decided success, if numbers and enthusiasm are reliable criterions. Three hundred teachers out of a total of five hundred and ninety-five were paid bonuses to the extent of \$3,000.00. Home projects numbering 2,688 were cared for in 1,500 homes in addition to 156 school gardens. The gardens were made of grains, vegetables and flowers, while the home projects consisted of growing vegetables or vegetable and root seed, growing grain, roots, the care of live stock, the collecting and mounting of weeds and the identification of weed seeds. The teachers occasionally met considerable discouragement because many school yards were not fenced, but owing to this movement a number of new fences have been built recently; many of the yards were of a tough sod and were cultivated with extreme difficulty; other very apparent opposition emanated from unsuspected sources due to a misapprehension of the idea, but the enthusiasm and hard work of the teachers and inspectors outlived much of this. Parents realized that their children were being encouraged to take up useful studies and to profitably employ their time

out of school hours; they were stimulated to apply some simple principles and in many instances the parents have been very agreeably surprised to learn that their boy or girl had grasped an idea entirely new and one which they might never have had except for this or other similar agencies. The Departments of Education and Agriculture co-operated closely while the plans were under formation, but the active superintending fell to Mr. R. H. Campbell, Superintendent of Education, now Col. Campbell commanding the overseas regiment in the process of organization.

THE METHOD EMPLOYED

In the spring the teachers supplied the inspectors with a list of seeds, such as flowers, vegetables, etc., that could not be secured in the section and they were distributed free. Instructions were sent out and the inspectors took charge of the detail work, assisted, when necessary, by the district representatives of the Department of Agriculture. Quite often definite assistance and instruction had to be given the teachers. The district representatives undertook this in co-operation with the inspectors. In one

inspectorate the teachers met and the district representative made a school garden, illustrating and explaining every detail. This is commendable because it saved much time in driving and the repeating of instructions many times. The usual difficulty, that of caring for the gardens in the summer, was met, but the Department is drawing the teachers' attention to this point, explaining that to secure the bonus next season some arrangement must be made, especially when a teacher is leaving and engaging a new school. Greater efforts will be made to interest parents and trustees, and when accomplished, the gardens will not suffer for cultivation, manure or attention.

PASSING JUDGMENT

The circulars distributed in the early part of the year outlined clearly that a certain bonus would be paid but no standard was formulated. At a joint meeting of the Departments, including the inspectors, it was decided that the attitude of the teacher and the general work in agriculture should be a consideration in addition to the excellency of gardens and home projects. The decisions were all left in the hands of the inspectors, who were the only men really qualified to judge. The number of gardens and home projects was so much larger than anticipated that the inspection became a serious undertaking, but proved of excellent value to the public school inspectors because they were afforded the opportunity to become closely associated with the parents and to gather diverse views and to enlist sympathetic support for the work, which very often was unnecessary; quite often they were joined in the inspection by members of the Department of Agriculture. The reports of the inspectors made to the Department of Education illustrated all too clearly that the teachers were, as yet dependent upon the inspectors and also proved

beyond question the value of an inspector who appreciated the idea of teaching "rural science."

Many teachers had every support from their people, whereas others had extreme difficulties which rendered the situation hopeless or only partially successful, though the teachers in the latter cases generally had to expend much greater effort than did the teacher in the better sections. Had the bonuses been paid on the basis of cultivating a garden and the existence of home projects only, much injustice would have been done. The cash bonus must be decided in every case by the inspector and the standard must be altogether based on the efforts made by the teacher and the general progress of the students.

PROGRAMME FOR 1916

The work of the past season aroused a great deal of enthusiasm and has served as an excellent introduction for the actual teaching of elementary agriculture in the school and for the incorporation of it as part of the curriculum. The bonuses were paid upon school gardens and home projects, plus the allowances made by inspectors in backward sections, but this coming year they will be granted only where a certain amount of time every week is set apart for agricultural teaching or discussion, thus affording the inspector an opportunity to record progress. The gardens and home projects will be carefully considered, but must serve only as adjuncts to the teaching, which is to inculcate into the training of every student a greater love for nature, a greater admiration for agriculture as an industry, a power to place proper values and to be an assistance in the making of agriculture more pleasant and profitable.

DUTIES OF THE TEACHERS

The teachers, and they are becoming more efficient, will be expected

to assume greater responsibilities, offering methods of teaching and thus eliminating part of the inspection duties that heretofore fell upon the inspectors, and which would soon be impossible under the old scheme as the number of participants increased. They may be asked to make formal detailed reports regularly to their inspector, and from this and his observations during visits he will be able to decide just what progress is being accomplished. The general attitude of the teacher and the children must be the deciding factor and if favourable the application of the principles by the students in their homes will be a matter of time only. Many of the teachers, it is true, are only partially equipped for the teaching of this subject, but arrangements are under way whereby they will receive every possible assistance. Every inspector has had ample opportunity to fit himself to be of material aid. The district representatives of the Department of Agriculture are always willing to co-operate with the inspector, or directly with the teachers at the request of the inspectors. The summer school last July was planned to meet the most urgent requirements of the teachers, and the one to be held next summer will be similarly arranged but probably offering some advance work over last year.

A RURAL SCIENCE DEPARTMENT

Through THE AGRICULTURAL INSTRUCTION ACT a "Rural Science Department" is being organized at the Prince of Wales college under the able direction of Professor S. B. McCready, and will be in order to give excellent instructions at the beginning of the year. This department will be accessible at all times to every teacher for information relative to their work. But probably the most valuable assistance will be in the form of a circular issued monthly containing suggestions

offering methods of teaching and probably outlining lessons or simple agricultural research work or compilations which may be successfully carried on in any rural school. Occasionally teachers' conventions are held, and also teachers' field meetings have been and will be arranged, where they can be given instruction under similar conditions to those surrounding their school.

THE HOME PROJECT SYSTEM

Home project work is apt to become monotonous unless some impetus can be added. The holding of school fall fairs will be introduced on a small scale in every inspectorate. They will be classed as demonstrations or experiments for the first year, and only a limited number held in order that the system may grow properly. The management of them, as soon as possible, should become vested in the children supported by their parents and teacher. Most of the arranging in the immediate future will necessarily be undertaken by the inspectors. Every assistance will be given by the agricultural staff. Prizes will be offered in such a way that they will be competed for by schools, thus engendering co-operative enterprise, and they will likely consist of small libraries or some school equipment. Individual competitions will also be held but in so far as feasible, the idea of competing for the prize only will be discouraged. The sympathy and co-operation of all the parents will be asked and doubtless received at the fair.

The system will, if properly devised, gradually develop the holding of individual school fairs or a uniting of not more than three or four schools in any instance. Sports or organized play will ultimately be a part of the fair as a means to teach team work or co-operative effort. The success of the movement depends very greatly on the individual support received from the officials

at the opportune time and directed through the proper channels in order to avoid any appearance of lack of unity of purpose.

The lively interest and genuine enthusiasm of the Superintendent of Education, Col. R. H. Campbell, who recently volunteered for Overseas service, will be much missed.

To his efforts co-ordinated with those of the Honourable Murdock McKinnon, does Prince Edward Island owe the system of agricultural education for the public schools, which bids fair to influence the trend of thought and action of the growing generation.

NOVA SCOTIA

BY L. A. DEWOLFE, DIRECTOR, RURAL SCIENCE SCHOOLS

THE progress of rural science in Nova Scotia has been very satisfactory since THE AGRICULTURAL INSTRUCTION ACT has given us the much needed financial assistance. Teachers get special training



L. A. DEWOLFE, B.A.
Director, Rural Science Schools for Nova Scotia

through the introduction of up-to-date methods. Nature study and the elements of agriculture have been well taught. Home gardens by school children have been popular. Gardens on the school grounds have been successful in some cases; but in others they have failed. The annual change of teachers was largely responsible for the failures.

at the summer school held each year in Truro. The number attending this school is increasing each year. The number obtaining diplomas or certificates during the last three years was 65 in 1913, 81 in 1914 and 109 in 1915. Besides 16 graduates returned in 1915 to do voluntary work in their chosen science subjects.

Almost without exception these teachers have improved their schools

As an adjunct to the school garden, the school fair has been extremely popular. No other agency brings the school and the parents together so effectively.

During the present year, as in the past, we hope to increase the scope of rural science work both geographically and pedagogically. Not only our specially trained teachers, but ambitious teachers everywhere are introducing rural science methods and topics. Rural science teachers influence their untrained colleagues. At teachers' conventions, rural science is discussed. In regular classes at Normal College, the importance of such work is urged. Through these influences, many teachers are doing better work than they formerly did.

PROGRESS OF THE WORK.

School exhibitions are becoming better organized. At first, the one-school exhibition was in evidence. Now, however, the combining of eight or ten schools is gaining in favour. In the past year, 34 exhibi-

tions representing 153 schools were held. This year, we are aiming at including larger areas in each district exhibition. We also hope to have a good rural science display at the Halifax provincial exhibition.

We shall continue to assist schools by supplying seeds, shrubs, etc., but our gifts will be small. We believe it is bad policy to give something for nothing. If children buy their own seeds, they will take better care of them than they will of gifts. Consequently seeds and shrubs will be given, sparingly, to those who have spent some of their own money for such material.

Schools where gardening has never been done will be given a few packets of seeds to introduce such work. When once introduced, however, we shall rely on the leadership of the teacher to keep it going.

Similarly, instead of giving settings of eggs, we shall make arrangements whereby children can buy settings from pure bred stock at a reduced price.

HOME INDUSTRIES AND MANUAL TRAINING

Domestic science is becoming more and more a feature of our rural schools. In some cases, the teacher gives instruction in sewing one afternoon each week. Often women of the section will assist the teacher, or even give all instruction in this line. As an example, in one school, the teacher and one woman teach sewing every Friday afternoon, and the local clergyman teaches the boys manual training at the same hour. In another case, while the teacher sews with the girls, a local carpenter instructs the boys in woodwork.

The experimental farm at Nappan kindly gave the children seed potatoes and seed grain last year, and required the customary reports of the

results of their crops. This, we hope, will be repeated this year.

We are laying more stress on flower growing than on vegetable growing. Already our people are too utilitarian—in their hap-hazard way. Not enough attention is given to beautifying home grounds, school grounds, church surroundings, roadsides and railway stations. Through the work of beautifying these places, important cultural methods are taught, which will apply equally well to vegetable growing. Incidentally, therefore, vegetable culture is taught; but the animal idea of *something to eat* is not at all times the central one.

PARENTS AND CHILDREN ALIKE PROFITING

After all, we are not making our schools wholly agricultural or horticultural. These and all other industries are used as the basis of the regular school subjects. All teachers are free to use whatever method they choose. It is evident, however, that those who are enthusiastic nature teachers are acquiring a hold on their pupils which the mechanical teacher of the older type cannot claim.

As a result of the garden movement, there is a deeper interest in such work. Not only the children, but the grown-ups are taking more pride in their lawns and their backyard gardens. Parents are encouraging their children to send material to the school exhibitions.

Thus far, we are not doing much in *experimental* gardening. The first requirement is to arouse an interest in any kind of gardening. After that interest is aroused, then competition will lead to the desire to grow better vegetables. How to grow better ones will lead to experimenting. Some of our children have reached that stage; but many are still at the first stage. Yet we hope!

NEW BRUNSWICK

BY R. P. STEEVES, M.A., DIRECTOR, ELEMENTARY AGRICULTURAL EDUCATION

THE second year of rural science work in the [province of New Brunswick under the joint control of the Departments of Agriculture and Education closed on June 30th last. Highly gratifying results were achieved during this time. Previous to July, 1913, an authorized nature study course was in use in some schools and school gardening had made some progress. Under the Schools Act special grants for school gardening had been paid to both teachers and trustees by the Education Department. The principle of the work was thus acknowledged. However no organization for supervision and extension existed and progress was therefore slow and uncertain.

THE AGRICULTURAL INSTRUCTION ACT passed by the Dominion Parliament opened the way for an advance movement. The Provincial Agricultural Department appointed a director who was given a legal status in the public schools. The financial responsibility hitherto borne by the Department of Education was assumed by the Department of Agriculture, while the school law and regulations thereunder provided the authority for the administration of the work in the schools.

THE WORK DONE

This arrangement has worked harmoniously. The nature study and agriculture course has been revised and prescribed by the Board of Education for use in all elementary schools. Rural science schools for giving special training and instruction to teachers have been established, equipment for experimental teaching has been installed in many schools, school garden libraries have been procured, literature, including pamphlets, circulars and instruc-

tion sheets, has been distributed. In nearly every county of the province school gardens on the school grounds or contiguous thereto have been begun, home plots conducted by pupils and supervised by their teachers have been started. These aim to express in the concrete at home the instruction given in the school through the school garden, while still the pupils are in touch with the school. The school fair idea has been inaugurated with success. An attempt is being made to vitalize Arbor Day observance in the schools, to make the school, not only a centre of intelligence and progressiveness for each district, but also an influence in disseminating social and co-operative efforts for community improvement.

FOUR SCORE SCHOOL GARDENS

At the present time there are some eighty school gardens in as many districts. Many of these are of a first class character. As they afford opportunity for all round education, their influence is favourably reflected in the school room instruction and school ground improvement. Double the number of pupils has been reported as receiving instruction this year as compared with last. Where last year we had reported fifty-nine home plots, this year we have three hundred and seventy-eight. One hundred and ninety teachers took the four weeks' course at our rural science schools last summer. Most of these have returned to their schools, many of which have gardens, to use local conditions for educative purpose, to practically direct children to more highly esteem the resources of their community and province because of a more intimate knowledge of their value.

INDOOR LABORATORY WORK

Experience during the year has convinced us of the great necessity for indoor laboratory work in conjunction with school garden application. Physical and chemical experimentation with soil and plants in the school leads to closer observation of natural conditions, of transformations and growth. It is not enough for pupils to see these experiments performed, they themselves must perform them. To this end there has been required in each school having a school garden conducted by a teacher receiving special grants, that all pupils of the upper elementary grades shall be provided with a small amount of apparatus for individual work. A balance with weights, an alcohol lamp, some test tubes, litmus, some acids, etc., make up the supply. In the agricultural instruction return submitted to the department at the close of each term, a statement is given by teachers whether such sets of apparatus have been supplied and whether experiments with soils and plants have actually been made by the pupils.

CHANGES IN RURAL SCIENCE TEACHING

Some changes have been found desirable in the syllabus of our rural science schools for teachers. While the principle of "learning by doing" has been put in operation it is found that too much time has been spent upon minute and low forms of life that have little bearing upon economic conditions. We well know that teachers in elementary grades have no opportunity to give such instruction and that children are incapable of apprehending it. In the work taken up in the future, from the "known to the unknown" will be our governing principle. Insects, birds and animals, domestic and otherwise, will be treated from the standpoint of general nature study and economic value.

The same principle shall govern to a greater degree than last year in the teaching in other departments of our rural science schools.

THE TEACHERS' SHORT COURSE

This year opens with a short course for teachers at Sussex. This is not designed for those who have attended our longer summer courses. The nature study course prescribed applies to primary as well as intermediate and advanced grades. Teachers accustomed chiefly to abstract presentation find difficulty in taking up this subject objectively and besides many have not the necessary knowledge and do not know how to proceed to obtain it direct from nature. The object of this winter course is to give such teachers an introduction to natural methods of obtaining information, so that they may inspire and direct their pupils. In the lower grades, habits of observation are begun through general nature study so that later in school life both training and knowledge may be utilized in the study of economic conditions and productive enterprise.

SCHOOL FAIR PREPARATION

In order to make school fairs an integral feature of the school in its effort to develop the community and draw together the efforts of both for mutual advantage it is proposed to draw up an official prize list to be submitted to schools early in the year. This list shall include not only prizes for natural products in the school garden and home plots but also for related school room work, viz., composition, drawings, arithmetical problems and bookkeeping, records of observations of natural phenomena. Encouragement will be given for three or four districts to combine in friendly competition and hold the fair at a central place. The amount to the prize list contributed by the

Department will be in a measure proportionate to the amount raised locally. With the development of the school fair schemes the school garden prize system at present in use will probably be discontinued.

Plans for the more general improvement of school grounds, for the better observance of Arbor Day, for the spread of knowledge and effort to secure better rural sanitation are being projected.

While town and village work will be pursued with quiet energy, extension effort in remote rural sections will be vigorously pushed. Here we recognize must the battle be fought which shall turn the tide

of the people's prosperity and permanently secure increased production and wealth.

To extend the children's knowledge of nature and inculcate a love of locality based upon knowledge, to use nature as a means toward an end, that end being a better kind of citizenship, to invest life with greater interest and hold pupils longer in school, to interlock the sympathies of the school and home, in a word, to make the school a live factor in the life of the community for the comfort, health, happiness and prosperity of its people, our efforts shall continue to be applied throughout the year on which we have now entered.

RURAL SCHOOL DEPARTMENT OF MACDONALD COLLEGE

BY J. EGBERT MCOUAT, DEMONSTRATOR TO RURAL SCHOOLS.

THIS department was created during the past year with a desire to do as much as possible towards assisting the rural schools of the province of Quebec to become more efficient centres of rural progress and learning.

It has no official relation with the educational department of the province, but is fortunate enough to have its co-operation and good will. Being started at a time when the study of nature study and agriculture was placed in the rural schools and academies as a subject on an equal footing with other studies of the curriculum, its endeavours to render assistance have been met with cordiality and co-operation.

Some of the lines along which it hopes to prove useful to the schools requiring assistance are as follows:

1. Seeing that all questions sent in by teachers with regard to agricultural problems in their community are dealt with and answered.
2. Helping teachers to procure suitable books, pamphlets, or literature of any kind, which may be of assistance to them in their work.

3. Helping to improve school grounds by furnishing shrubs, perennials, vines and bulbs at very low prices. Whenever possible the department is willing to see that the work is done under personal supervision.

4. Furnishing bulbs, etc., to teachers who wish to beautify their school-rooms. These are supplied at the lowest possible rates.

5. Carrying on agricultural short courses in the rural schools and academies whenever it is agreeable to the teacher and school boards of the same.

The commencement of the department is so recent that as yet we cannot point to a great deal of progress, but some preliminary work has been accomplished and a year of increased usefulness is looked forward to.

An effort has been made to make the work of the department known and this has been accomplished by meeting the teachers in the regular fall conferences, by conferring with school boards, holding public meetings in different places, and visiting many of the rural schools and giving every possible assistance to the teachers in their nature study work.

During the fall six school grounds,

three in Brome county and three in Sherbrooke, were improved through co-operation with the school boards. Arrangements have also been made to improve several school grounds next spring, some of these being the academy grounds at Shawville, Huntingdon and Ormstown.

Our efforts to arrange for short courses of two days in some of the academies and model schools have been well received. The work of these courses will be based on the regular nature study and agricultural work of the schools and will be made as practical as possible. It is hoped in this way to render assistance to many teachers who are having a great deal of difficulty with this new subject of instruction.

At the time of writing, plans have been made to hold such instructional work in the following superior schools:—Bulwer, Bury, Gould, and St. Andrews Model schools; Waterville,

Lennoxville, Danville, Cowansville, Huntingdon and Aylmer academies. More of these may be held if time will permit and suitable arrangements can be made.

Our work for the coming year will thus contain two main issues, work in the schools of the province along instructional lines and the improvement of school grounds. At the end of that time we hope to be able to speak with more assurance as to whether the policy of assistance adopted has been of any value to those receiving it, and to state with more definiteness our plans for the efforts of the second year.

To-day the work is only beginning and beginning in a field where very little has been attempted along such lines. It is hoped that all those interested in these efforts to improve rural conditions will co-operate to make such efforts at least a partial success.

MANITOBA

BY H. W. WATSON, M.A., DIRECTOR OF ELEMENTARY AGRICULTURE

DURING the past year a marked increase in interest has been displayed by both teachers and trustees in this important branch of education. Most of the new school sites, especially those in connection with consolidated schools, have had land prepared upon them for the planting of windbreaks, ornamental trees, and school gardens. Many old sites that previously had not even been fenced have been improved in the same manner. Teachers and trustees are beginning to realize the value of making the school buildings and their surroundings as attractive as those of the best farm homes of the district. Many teachers have advanced beyond the "playing at gardening" stage, and are making this subject of real educational importance by relating it and the other

subjects on the curriculum to the interests of the home.

IN PRIMARY SCHOOLS

The work for the primary schools is fairly well organized and the number of schools having gardens is increasing rapidly each year. Considerable material for agricultural work in the schools was distributed during the year by the Department of Education. Grains, potatoes, alfalfa, and tree seedlings were distributed free; while vegetable and flower seeds, shade and ornamental trees, perennial flower roots and bulbs were distributed at wholesale cost prices.

A suggestive outline of rural science work to be carried on, month by month, was made out and furnished to each teacher at the begin-

ning of the year. These outlines were to be filled in by the teachers, as the work was done, and, at the end of the year, sent to the Department of Education.

SEED CORN CONTEST

Last year a corn growing contest was organized. Seed corn (Jehu variety) was distributed free on application. A team of three pupils represents each school, and each pupil exhibits his six best ears of ripened corn. The present competition will continue for three years. A silver cup will be won yearly by



H. W. WATSON, M.A.
Director of Agricultural Instruction for Manitoba

the school obtaining the highest score. The school that obtains the highest total score for the three years will obtain permanent possession of the trophy. Over one hundred schools entered the contest last year and many additional ones will enter this year.

Owing to late frosts in June and early frosts in August, the last was a very poor season for ripening corn; but still several schools had specimens of very well matured ears.

BOYS' AND GIRLS' CLUBS

During the spring, the Extension Service of the Agricultural

College organized about fifty-five boys' and girls' clubs with a membership of about 5,500 rural girls and boys. Corn, potatoes, grain and eggs were distributed free and contests were held in:—fodder corn growing, potato growing, poultry raising, pig feeding, farm woodwork, crocking, sewing, canning of corn, peas and beans.

The work in connection with the boys' and girls' club was carried on at home and served as an excellent supplement to the agricultural work of the school.

IN SECONDARY SCHOOLS

As yet there is no regular course in agriculture in the high schools, but a number of the science teachers are giving the present science course a special agricultural application. We expect, by another year, to have the science of consolidated, intermediate, and rural high schools cover a full course in rural science. Such a course may include:

- 1st year—Farm crops, and subjects related thereto.
- 2nd year—Farm animals, and subjects related thereto.
- 3rd year—Agricultural physics, chemistry and bacteriology.

There are, however, five schools in the province that have added agricultural specialists to their staffs and have introduced a course specially suited to the farm boys of the districts. This course begins November 1st and continues until March 31st. The work covered, during two winters, in this course is similar to that covered by students of the first and second years at the Agricultural College, Winnipeg, many boys of Grades VIII and IX standing elect to take this course in preference to that of Grades IX and X of the regular High School course. Some of those who have taken the two-winters' course purpose continuing their education at the Agricultural College. During the summer each boy carried on several

home projects on experimental plots:—

- (1) In growing alfalfa, for fodder and for seed.
- (2) In seed selection, wheat, oats, barley, for three years.
- (3) In a three year crop rotation.

During Easter week the Agricultural College staff arranged a judging contest for teams of boys from these classes. Three boys represented each school, and competed at the college in the following:—

- (1) Cattle judging—beef type.
- (2) Cattle judging—dairy type.
- (3) Horse judging—agricultural class.
- (4) Grain judging—wheat, oats, barley for seed purposes.
- (5) Milk testing—the percentage of butter fat.

The boys take a great interest in these competitions and there is considerable rivalry in obtaining a position on the judging team.

“Back to the land” is the cry

heard to-day from every corner, and much thought and money are being expended to accomplish this end. “Prevention is better than cure” is a wise maxim and should have been practised in this connection many years ago. It is a wise policy to bring “back to the land” farmers’ sons that have been allured to the city to follow other occupations, but it is a wiser and an easier policy to “save for the land” the rising generation before they have tasted of the city’s allurements. This problem the rural school alone can solve. “When mind co-operates with muscle, we get a new man,” and when the education of the mind includes that of the eye and the hand, we get a new school. When courses in agriculture, manual training, and domestic science are introduced fully into our consolidated and rural high schools, then only will the best education be made available to the greatest number of our rural children.

SASKATCHEWAN

COMPILED BY A. W. COCKS, B.Sc., DIRECTOR OF SCHOOL AGRICULTURE

THE policy of the Department of Education of this province with respect to rural science work has been considerably developed during the past year. The greatest progress has been made towards instruction in agriculture and household science. Early in the year 1914 the Agricultural Instruction Committee was appointed by the Minister of Education. This committee is composed of :—the Superintendent of Education (chairman); the Deputy of Minister Education; the Dean of the College of Agriculture; the Deputy Minister of Agriculture; the Director of Extension Work, College of Agriculture; the Professor of Agricultural Engineering, College of Agriculture; the Principals of the two Provincial Normal Schools and the two Directors of School Agriculture. The latter, in the persons of

F. W. Bates, M.Sc., and A. W. Cocks, B.Sc., were appointed in May on the recommendation of this committee. A Directress of Household Science, in the person of Miss F. A. Twiss, was also appointed earlier in the year.

THE OUTLOOK FOR THE PRESENT YEAR

Since the formation of the province nature study has formed a part of the public school curriculum and has also received attention in the normal schools. During the past year agriculture has become an important subject at each of the normal schools, Mr. Bates being responsible for the instruction at Saskatoon and Mr. Cocks at Regina. These gentlemen will also conduct courses of lectures at the third class normal sessions to be held at various points in the pro-

vince during the first few months of 1916. To assist in the training of teachers for the work a short course in agriculture and nature study has been held at the University for the past two years. A special course for science teachers was provided in 1915 and it is intended to continue and to lengthen both of these courses in 1916.

By means of the teachers' institutes and conventions the directors have been enabled to address large numbers of teachers and trustees on

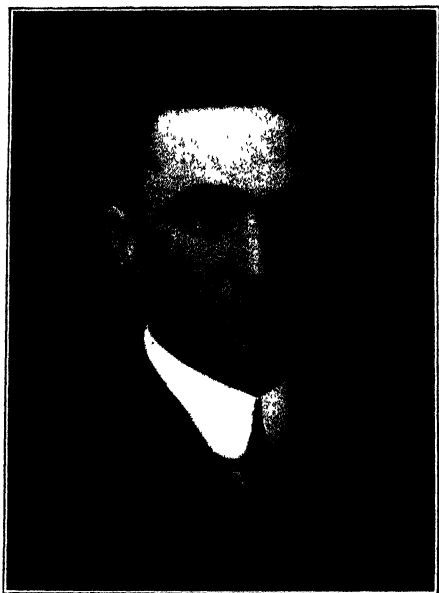
entitled "Suggestions for Teachers", "Rural Education Associations", "School Fairs" and "The School Garden" are in course of preparation.

From the reports on school gardens and school fairs which have already appeared or will appear in THE GAZETTE it will be noticed that these phases of the work have made considerable headway during the past twelve months and it is confidently expected that still greater progress will be made next year.

AGRICULTURE AND NATURE STUDY

The subject of agriculture and nature study appears in some form on the course of study for each grade of the public school, and is compulsory for the Grade VIII examination, the qualifying entrance test for high schools and collegiate institutes. For two or three years botany and agriculture was a subject of examination for the first year of the teachers' course. In 1914, however, this subject was made an elective with household science or book-keeping for the teachers' third class diploma and an elective with household science and languages for the teachers' second class diploma. For this year's teachers' examinations agriculture will be an elective subject with household science only for the third class diploma, but no change is contemplated until 1917 with respect to the second class diploma.

The teachers of the natural sciences up to the present time have been responsible for the agricultural instruction in the high schools, but this is generally recognized as a rather unsatisfactory compromise and an effort is being made to encourage more of our young men to prepare themselves as educational agriculturalists by taking a course of professional training for teaching and the B.S.A. course of the College of Agriculture. As an immediate solution of the problem respecting instructors for the agricultural work in the high schools and collegiate institutes the employment of itinerant teachers of



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Director of School Agriculture for Saskatchewan

the importance of agricultural instruction and to give assistance in the formation of organizations which will be known as "Rural Education Associations." About 1,700 teachers have been reached by these meetings in addition to the large numbers met by the directors in the normal schools.

Several bulletins on tree planting, school gardening, distribution of trees, shrubs and seeds, etc., have been prepared and distributed to the schools of the province, while others

agriculture has been proposed. Each institution would have the benefit of the services of one of these well-qualified men for a period of two or three months. This proposal, however, is still under consideration.

RURAL, HIGH AND PUBLIC SCHOOLS

The directors of school agriculture have been asked by the Agricultural Instruction Committee to draft a recommendation respecting rural high schools. It is hoped that by some slight change to The Secondary Education Act the establishment of these schools will be made possible. Such a school would be supported by the territory from which its students would be drawn and although agriculture, household science, manual training and such practical subjects would be given prominence, yet according to the present general opinion this school should supply all the reasonable educational needs of the community excepting those being provided by the public schools.

The work of the coming year in the public schools will consist of nature study, school gardening and elementary agriculture and although considerable attention will be paid to the acquisition of knowledge yet an effort will be made to encourage this work, more particularly for its educational value in training the powers and faculties of the child and for its value as a factor in the development of character.

The Rural Education Associations, some of which have already been organized, will consist of teachers, trustees and other individuals interested in educational and social work. It is expected that these associations will take charge of school fairs, boys' and girls' clubs and contests and social service work generally.

HOUSEHOLD SCIENCE INSTRUCTION

With regard to household science it must be noted that previous to the past year the teaching of this subject in the province was almost entirely confined to the four cities—

Regina, Saskatoon, Moose Jaw and Prince Albert. In each city a specialist was engaged to teach and to supervise the work of assistants and teachers of public school classes. In Prince Albert only was instruction given to high school classes. During the past year the effort has been to extend this work to the rural communities. Through the medium of teachers' conventions and teachers' institutes teachers have been urged to teach sewing and sanitation and wherever practicable to have the pupils prepare for themselves each day one hot dish to supplement the cold noonday lunch. As a result, such work is being carried on successfully in a number of rural schools. The teachers in training in the normal schools are receiving special instruction in sewing and the preparation of hot dishes, within a given cost, suitable for noon lunch for two classes attending the Model School. This gives the teachers practical experiences in actually working out the lunch problem.

The short course in household science held at the Normal School, Regina, last summer proved to be very successful and will be repeated this year.

A town school with eight teachers last year purchased an equipment for teaching household science and engaged a teacher who is a graduate in household science to take charge of the first year primary class. As these children spend but three and a half hours each day in school the remaining two hours of the teacher's time is given to instruction and supervision of sewing in grades I to VI, and in teaching cookery, sewing and sanitation in grades VII and VIII and in lower and middle form high school classes. This is the solution of the problem for village and town schools and during this year efforts will be directed towards a similar accomplishment in other villages and towns, the ultimate aim being to make the subject of household science an integral part of the high and public school system.

ALBERTA

BY J. C. MILLER, B.Sc., PH. D., PROVINCIAL DIRECTOR OF TECHNICAL EDUCATION

ONE year ago the provincial government authorized an arrangement of a schedule of grants in aid of instruction in the manual and the household arts, the fine arts, pre-vocational, vocational and technical instruction, night class instruction and last but by no means least, instruction in science and agriculture, not only in the rural but also in the city schools. These latter courses are examination subjects in both the public and high schools.



JAS. C. MILLER, B.Sc., PH.D.
Director of Technical Education for Alberta

In order to provide provincial leadership in the field of work, to arrange for its introduction into the schools, to develop the necessary organization for the supplementary training of the teachers and inspectors, to harmonize and adjust the courses of study in such a way as to make room for the greater emphasis required in these special subjects and to supervise and inspect the work undertaken, a Provincial Director of Technical Education was appointed. With such responsibilities regarding

the several lines of work indicated in the foregoing it has been impossible for the Director to give that undivided attention to the furtherance of rural science instruction that has been possible, no doubt, in the other provinces where one and, in some cases, two men, are devoting their whole time exclusively to this particular problem.

THE OUTLOOK PROMISING

Very definite progress has been made, however, and the outlook for further development next year is splendid. As a result of the work done at the summer school for teachers we now have three hundred and fifty public school teachers, thirty-five high school teachers and twelve inspectors who have completed two summers' work in the same subjects. Last summer about one hundred rural schools, ten towns and two cities had school gardens. One of the special features incorporated in the Alberta scheme is that of having the high school as closely related to this type of work as the public school. In some of the towns the development has been remarkable when it is considered that this is the first year during which they have made any effort to develop this type of work. Many additional districts, both rural and urban, have done the preliminary work necessary to ensure having the necessary ground ready for next year.

During the year the new text book in agriculture for Grades VII and VIII, written especially for Alberta, was completed and published. The Department of Education furnishes this book free to every *bona fide* pupil in these grades and to teachers and normal students at cost. The course in agriculture for Grade XI having been tried for a year, was carefully

revised in the light of the year's experience.

THIS YEAR'S PLANS OUTLINED

The plans for 1916, while they cannot all be made until after the legislature meets owing to the fact that the more important must necessarily be contingent upon legislative approval and provision, involve the following:

(1) The provision for the summer school for teachers must be such as to provide for not less than 500 teachers if we do nothing more than provide for those who will have to be admitted. This will greatly increase the number of teachers qualified to give instruction in science, agriculture and gardening in the rural, town and city schools. A special effort will be made to increase the attendance of high school teachers and public school principals in order that the work in urban centres may be developed and strengthened.

(2) The course of study in nature study, gardening and agriculture for grades I to VIII inclusive is to be restated in a more full and helpful way, made more practical and closely

related to the text books now in use.

(3) A special bulletin giving a wealth of suggestions and helpful directions and information regarding school gardening, home gardening, tree planting, equipment, organization and methods of instruction is being prepared and will be ready for distribution before spring.

(4) A similar bulletin relating to instruction in science and agriculture in the high school grades will also be prepared during the year. The courses in botany and zoology for grades IX and X which are intended to form a basis for the agricultural course of grade XI will be made more practical and experimental.

(5) Definite steps will be taken to strengthen and extend the work of childhood and youth in connection with the autumn fairs, not only by positive action through the teachers and pupils of the schools but also through co-operation between the school authorities and the agricultural societies and women's institutes.

Other constructive measures are under consideration but their final approval must await the provision of funds.

BRITISH COLUMBIA

BY J. W. GIBSON, M.A., DIRECTOR OF ELEMENTARY AGRICULTURAL EDUCATION

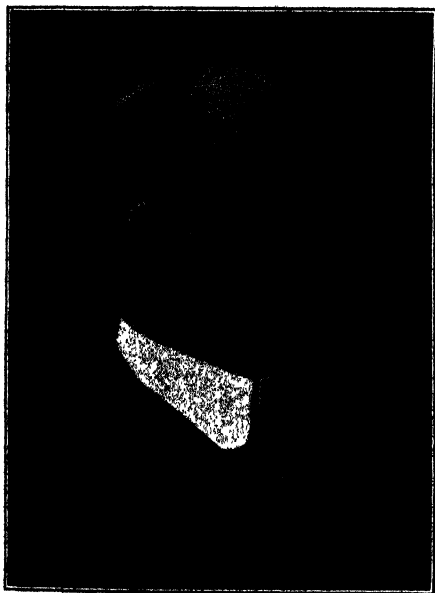
WE have just witnessed the passing of a most remarkable year in the history of our country and of our Empire. True, it has been a year of strife and of preparation for still greater strife, but it has also been a year of triumph, of progress and of prosperity. In some parts of Canada and with some people it has been a year characterized mainly by privation and sacrifice—two great experiences, by the way, that people look back upon with a degree of solemnity, but without a shadow of regret. The year has taught many a man

in Canada some life lessons and has produced generally a different outlook for our people. Life's outlook has not only been broadened, but also deepened and intensified. New values have been placed upon neglected things. Personal integrity is being developed through personal sacrifice and by devotion to personal, as well as to national, duty. During the year, our population has not increased very much, but we have developed higher ideals and a saner view of life. The women of Canada, through individuals, as well as through organized effort,

have done much to alleviate distress at home as well as on the battle-fields of Europe, and to strengthen the hands of those who are directing the affairs of state. Their splendid work will be an inspiration to the people of Canada for years to come.

ADVANCE OF EDUCATION

To the schools of the Province, also, has come a broader vision and a deeper concern for the welfare of our people, young and old. The work of the schools is being considered more and more from the standpoint of its bearing upon the



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Director, Elementary Agricultural Education for
British Columbia

future work of the pupils, as well as from the standpoint of their mental and moral development. The teachers themselves are showing a keener interest in the great problems of education and are coming more and more to take their rightful places as leaders in all good works initiated in their respective communities. There is seemingly an

almost universal desire on the part of our teachers to prepare themselves to conduct with efficiency those newer lines of work which all modern educational systems now demand. No further proof of this need be cited than the fact that nearly seven hundred teachers, or thirty-seven per cent of all of the teachers of the province, took advantage of the summer school established by the Department of Education at Victoria, during the past summer. In the previous year almost six hundred teachers attended these special classes, and it is evident to anyone who takes the trouble to visit our schools that real progress is being made in the teaching of those subjects which the summer schools were specially planned to encourage. During the two years three hundred and fifty-nine teachers have taken courses in rural science, most of whom will undertake some work along that line for the coming year.

SCHOOL GARDENS AND SCHOOL GROUNDS

Last spring about one hundred new school gardens were started in British Columbia, some of which did not meet the requirements of the Department as to size and management. Between sixty and seventy of these gardens, however, were carried through successfully, and will receive grants. Another important branch of the work inaugurated during the year is the improvement of school grounds, apart from school gardens. Some thirty school boards have taken up this line of work already, and others are planning to begin in the spring. The school buildings in this Province are exceptionally good, and it is our aim to bring the school grounds up to the same standard of excellence. In this connection, I may point out that one of the strongest points in favour of our scheme of school grounds improve-

ment is the close co-operation of each school board with the teachers and inspector, as well as with the pupils themselves. The principal of the school is a member of the school grounds improvement committee, which reports to the school board direct. We are so arranging it that the beautification of school grounds and the maintenance of them from year to year will not become merely the work of a caretaker. During the period whilst boys and girls are in the primary and intermediate grades of the public school, they will become acquainted with many varieties of flowers and vegetables, and learn how to grow them successfully. When they reach the higher or senior grades, they will be in a position to apply their knowledge of flowers by preparing with the guidance of their teachers a scheme of floral decorative planting for the grounds, and each class in the seventh and eighth grades will be given a definite portion of the grounds to look after, and will attend to the planting and care of the flower borders or other floral decoration. In addition to this, these more advanced classes will have home projects in vegetable or flower-growing, in agricultural experimentation, or the care of poultry or other live-stock. The character and leading interests of the district from which the children come will help to determine the exact character of the work to be done under the heading of home projects.

IN THE HIGH SCHOOLS

Finally we are hoping to carry the rural science work, begun in the public schools, on into the high schools and to bring those schools more than ever before the schools of the people. Where possible, a special agricultural teacher will be attached to the regular teaching staff of the high school, and will conduct a definite course in agricultural science, covering two or

possibly three years. Boys who successfully complete this course will receive suitable credits on entering the Provincial College of Agriculture. Girls in regular attendance at the high school who are preparing to enter the teaching profession are also encouraged to take this agricultural option, thus fitting themselves to teach rural science successfully in their own schools later on, and, at the same time, qualifying them to receive a rural science diploma. This new departure in high school courses in British Columbia has been introduced in the Chilliwack High School, and gives every promise of success. Mr. J. C. Readey, B.S.A., who for some three years was provincial soil and crop instructor in British Columbia, is in charge of the work. He has a class of eighteen regular students in the high school, half of which are boys and half girls. They are making good progress in their agricultural studies and, according to a recent report from the principal of the school, are above the average in all other branches. Mr. Readey also conducts an extension class in agriculture two half-days and one evening per week in the high school for young men of the district who are not in regular attendance at school, but are mostly engaged in practical farming. At the present time eleven young men are taking advantage of these classes, some of them coming regularly from a distance of eight or nine miles to attend. Mr. Readey also acts as district supervisor of agricultural instruction, and visits regularly the public schools of the municipality of Chilliwack, directing the work done there in rural science. He thus gets to know many boys and girls personally who, in all probability, will become his regular students in the high school.

EXTENSION EXPECTED THIS YEAR

We hope to extend the plans which we inaugurated in 1915 during

the present year; we must practise economy in all our departments, but it is a false economy that would curtail such expenditures as are instrumental in preparing our young people to take their places amongst those who must do the world's great work of agricultural production in the future. Moreover, these young men and women now being trained in our schools will presently be the leaders of the people in agriculture, as well as in other pursuits,

and the greatest need of the world after the war is over will be intelligent leadership.

My message to my many co-workers in educational as well as in practical agriculture at the beginning of this new year, and to all teachers of the youth of our glorious Dominion would be, "Look to the good of your boys and girls in the ranks, inspire them by your own example, give them vision as well as direction, and then the forward march!"

SCHOOL FAIRS

NOVA SCOTIA

BY L. A. DEWOLFE, DIRECTOR, RURAL SCIENCE SCHOOL

THE AGRICULTURAL GAZETTE of January, 1915 contained an account of school fairs in Nova Scotia for the preceding year.

The year just ended showed no great change except in the number of schools taking part in exhibitions. In 1914, seventy-one schools exhibited their produce. In 1915, the number was one hundred and fifty-three. These schools did not all hold local fairs. The tendency has been towards larger district fairs, rather than one-school fairs. There were 34 fairs altogether.

Among our largest exhibitions were Hantsport, 15 schools; Bridgewater, 12 schools; Musquodoboit, 12 schools, and Berwick, 11 schools. At every county exhibition, except one, there was a rural science department. In some cases this was small; but in others—notably Bridgewater, Shubenacadie, Yarmouth and Digby—the school exhibits were very creditable indeed.

One trouble at county exhibitions is the lack of space. Schools are supposed to be an insignificant part of any community; and, consequently, a small table in some obscure corner of the main building

is allotted to them. When, however, that table becomes over-burdened with exhibits piled two feet deep, the committee in charge discover that they have underestimated the producing power of the schools. As a result, ample space is promised for the coming year. Crowded quarters in Bridgewater and Yarmouth in 1914 led to our having large rooms—about 60 feet by 80—assigned us in 1915. And we filled them! Crowded quarters in 1915 have led to encouraging promises for 1916.

Children numbering 3,200 exhibited something in 1915, against 1,300 in 1914. Practically no more money was pent in prizes this year than in the previous one. Many schools worked well without money prizes. They were content with ribbons or prize cards. In other cases the individual prizes were smaller than at first.

The Education Department gave \$302.19 towards prize lists. The total sum raised locally was \$310.00. The local money was raised by school concerts, sale of ice cream, individual gifts and admission fees to the exhibitions.

As a result of the fairs, there exists a greater interest in the schools than ever before.

A valuable feature is the holding of fairs in connection with teacher's Institutes when these Institutes meet in the autumn. Thus, teachers

cidedly successful. Inspector Robinson of Canning did the same at both Berwick and Hantsport. The co-operation of these Inspectors is worth very much to the progress of rural science.

The combined attendance at all



PART OF SCHOOL CHILDREN'S EXHIBIT, BRIDGEWATER, NOVA SCOTIA

who know nothing about such work have an opportunity to see how it is carried on. In many cases they go back to their schools and begin preparations for a local fair. Inspector Creighton, of Halifax, combined an Institute and School Fair at Musquodoboit, which was de-

our fairs last year was about 20,000.

In one district, this year's prize-list was in the hands of the children a few weeks after last year's fair. That started them at making plans while their enthusiasm was still high.

QUEBEC

REPORTS FROM DIFFERENT COUNTIES

In response to a request for some account of the school fairs in the different counties and districts of Quebec province, a number of reports have been received from the Macdonald College Demonstrators which are herewith presented in condensed form. In every instance the writers testified to the good that was being done, urged the necessity of parents, teachers and school-boards taking an active and appreciative interest in the work, as well as the pupils, and dwelt upon the prospects of improvement and expansion this year

RICHMOND COUNTY

From C. H. Hodge, B.S.A.

The first school fairs ever held in Richmond County were held on September 23rd and 24th, at Danville and Richmond. In all there were twenty-five schools taking part, ten in the Danville fair and fifteen in Richmond.

The work being new to both the teachers and pupils only fifty per cent of the pupils in the schools took exhibits to the fair. This percentage will without doubt be considerably higher this year when the work is better understood.

At the Danville fair about ninety pupils brought exhibits. The Richmond fair was noticeably larger, the total number of entries being over two hundred and a number of the pupils brought weed collections with their exhibits of grain and corn, etc. The attendance during the day was probably around five hundred.

That the school fairs this year will be more largely attended may be safely concluded by the favourable remarks which were made about the fairs by those attending last year, and by the enthusiasm which the children showed in several schools, which have been visited already in

preparation for this year's work. From the experience gained last year a number of improvements in the fair will be made.

SHERBROOKE COUNTY

From W. G. Macdougall, B.S.A.

The annual school fair for the county of Sherbrooke was held in the Lennoxville Academy gymnasium on the 18th of September. The school fair had been held in previous years in a tent in connection with the Sherbrooke exhibition, but it was felt that if the school fair could be held at some Academy it would better direct the attention of the pupils, parents and teachers to the importance of the work being done in the schools. The various competitions were open to the school pupils residing in the townships of Ascot, Orford, and Compton.

The entries included 34 in the poultry classes, 61 in potatoes, 7 in tomatoes, 9 in swedes, 10 in oats, 69 in flowers, 9 weed collections, and 4 weed seed collections.

The judges were:—Prof. Lochhead, weed collections, Prof. Murray, oats and swedes, Mr. M. A. Jull, poultry, Prof. J. Murray and Mr. T. F. Ritchie, potatoes, tomatoes and flowers. The chickens were hatched from eggs supplied by the Macdonald College Extension Branch, and the grain, vegetables, and flowers were grown from seed supplied by the same branch.

PONTIAC COUNTY

(From J. K. King, B.S.A.)

Very little change was made in the management of the school fairs in the county last year over 1914, with the exception that one more fair was held, making two for the county. The school fair at Shawville took in some twenty-six schools within a

radius of twelve miles of Shawville. Three hundred and eighty-seven pupils took part, exhibiting around two thousand exhibits. In several classes such as potatoes there were over one hundred exhibitors. In the class of colts nearly a score lined up before the judge. The attendance was about two thousand, the increase in interest of the parents being marked over that of 1914.

This was the first year for the Chapeau school fair, and, therefore, there was not the same interest as where a fair had been previously held. Ten schools took part and one hundred and ten children exhibited, making a total of three hundred and twenty-five exhibits.

The Chapeau school fair was held in a tent in connection with the agricultural society fair and suffered in attractiveness by the proximity of larger exhibits.

COMPTON COUNTY

From J. H. King, B.S.A.

The first school fair work in Compton county was begun in 1914, and the first fair was held in the Cookshire academy on Sept. 18th of that year, and was so successful that it was decided to not only continue with it but to enlarge upon the work. Consequently two school fairs were held in Compton county during the past year, one at Cookshire and the other at Scotstown.

As was the case in the previous year, the material, which included samples of oats, barley, potatoes, turnips, tomatoes, corn, flower seeds and eggs, was supplied by Macdonald College and distributed in the spring by the Demonstrator, who also supplied the directions.

The pupils of twenty-eight schools, comprising 319 pupils, received material and nearly two-thirds of this number exhibited at the Cookshire school fair, while twenty-three schools were included in the Scotstown school fair, comprising 240

pupils, of which number only about one-half exhibited their produce.

The school fair in Cookshire was held on Sept. 30th, while the one at Scotstown was held on Oct. 1st. The weather on both days was all that could be desired, and the attendance large, there being over five hundred people present at the Cookshire fair and about two hundred at Scotstown. Many of the exhibits were excellent, especially was this true of the potatoes and turnips, and the interest manifested by the young exhibitors and their parents was very encouraging.

During the past year a director was appointed from among one of the older pupils to assist the demonstrator with his work; the duties of the director being to send in the names of the children desiring material, to distribute the prize lists, accompany the inspector when scoring the plots, etc., and to furnish any information that the demonstrator may require.

HUNTINGTON AND HOWICK

From R. E. Husk, B.S.A.

In 1914, we conducted two school fairs in this district, Huntington and Howick, including in the two fairs ten schools. In the year just passed we had three fairs, Huntington, Howick and Hemmingford, including altogether about twenty-five schools, with 500 pupils. We added to our list, peas, barley, oats, also two varieties of tomato seed, and Irish Cobbler potatoes. Besides these, Quebec Yellow corn, Barred Plymouth Rock eggs, Green Mountain potatoes, and three varieties of flower seed, as in 1914.

At Huntington we had an attendance of approximately three hundred and fifty people, many of the older people not coming on account of harvesting, etc. Fifteen dollars was subscribed to aid in the prize list. A programme of races was put on for the children during the time the judges were working. Principal

Crutchfield of Huntingdon academy was in charge. The judges were: Flowers, Mrs. W. F. Stephen and Miss Rose; Weed collections and Map Drawing, Miss C. E. Black; Grains, E. G. Wood; Poultry, M. A. Jull; Vegetables, R. E. Husk. The exhibits were large and very good in each class; one hundred and thirty-five pupils making entries. Sixty-two dollars and fifty cents were awarded in prizes for the exhibits and five dollars and fifty-five cents for the races.

At Howick we had an approximate attendance of 400; 300 of whom were school children. The Homemakers' Club also had exhibits of flowers and

vegetables. The judges were Mrs. Stephen and Miss Rose, Mr Jull and Mr. Boving. The exhibits were fine with the exception of poultry, which was not as good as at Huntingdon. A hundred and forty-nine pupils made entries. Sixty-two dollars were distributed in prizes as well as awards by the Homemakers' Club.

This was the first year a school fair had been held at Hemmingford and the exhibits and entries were not so large as at the two other fairs. Sixty-nine pupils made entries and some creditable exhibits were brought out. Miss Black, Mr. Jull, Miss McIntosh, Mr. Wood and R. E. Husk acted as judges.

ONTARIO

BY C. F. BAILEY, B.S.A., ASSISTANT DEPUTY MINISTER OF AGRICULTURE.

WITH each year comes the added assurance that the school fair has passed beyond the experimental stage and is destined to become an important factor in Ontario's agriculture. With a modest beginning in 1912 of 25 school fairs, the work has made such rapid progress as to warrant the holding of 234 school fairs during the past season. These fairs were held in 41 counties or districts and included 2,291 school, representing 48,386 children. Seed was supplied and instructions given to the children for the planting of and caring for 51,243 plots. They were also supplied with 6,868 settings of eggs of a bred-to-lay strain. The total number of entries at the school fairs amounted to 116,236 and the total attendance, including children and adults, was approximately 157,000.

DEVELOPMENT OF THE MOVEMENT

In the March issue of THE AGRICULTURAL GAZETTE, Vol. 1, No. 3, page 175, and again in the January issue, Vol. 2, No. 1, page 54, articles

were printed dealing with the history and development of the school fair movement in Ontario hence it is not necessary here to do more than refer to a few of the newer features of this work. As pointed out in previous articles, the inspection of the children's plots during the growing season is considered a very important factor. Not only are the children benefited by the visit of an expert to their plots, but an opportunity is afforded the district representative to reach the parents and interest them in his work. Equally as important is the giving of reasons for the placing of awards at the school fair. It enables the children to appreciate the importance of more careful selection and preparation of their exhibits and is sure to have a very important bearing upon the quality of the exhibits from year to year. This feature of the school fair, wherever introduced, not only interested the children but was greatly appreciated by the adults and will be carried out in future at all school fairs.

ORATORY AND LIVE STOCK JUDGING

The public speaking contests which were introduced last year have come to be a very important feature of the fair. While it was thought improbable that many children between the ages of 10 and 15 would take part in a contest of this kind, it was surprising to find that very few school fairs were without a public speaking contest and the number of entries at a fair was often as high as eight or ten. It is necessary to hear these young boy and girl orators to fully appreciate the value of a contest of this sort.

PATRIOTIC POTATO PLOTS

In the early spring of last year it was suggested that the children grow a plot of potatoes to be sold, the proceeds to be used for some patriotic purpose. In order to insure uniform quality, seed was supplied by the department. The plots were inspected by the district representative and prizes given as was the case with other crops grown for the school fair. Prizes were also given at the school fair for the best samples of potatoes secured from the war plots. A large number of children responded to the call and there was every indi-



JUDGING CALVES AT A SIMCOE COUNTY SCHOOL FAIR

This year for the first time an inter-school live stock judging contest was conducted at two different fairs. Farmers in the neighbourhood took a great deal of interest in these contests and rendered valuable assistance in teaching the children how to judge stock and in supplying animals for competition on the day of the fair. It has been the practice to have the children exhibit calves and colts and while this feature of the fair may be continued, the live stock judging competition will undoubtedly take its place to a very large extent.

cation that their contribution would amount to several thousands of dollars. Unfortunately, however, the season proved unfavourable, so much so that many of the plots have not been harvested. However, when the reports are received from all the districts, it is expected that a very creditable showing will be made.

SPECTACULAR INTER-SCHOOL PARADES

At a number of the school fairs, inter-school parade contests were conducted and proved to be quite spectacular in many instances and much appreciated by all. The

schools were required to parade before judges who scored them on marching, singing and originality of design showing the identity of school. For example, school section No. 10 might form up to form the Roman Numeral X, another might carry flags to indicate the school. After the schools were judged and placed in order of merit, they marched round the fair grounds singing patriotic songs. In some cases elaborate preparation was made for these parades and would seem to indicate a danger of receiving more attention than its value would warrant. However, when kept within reasonable bounds, it becomes a very desirable part of the school fair programme if not limited for time.

REFRESHMENT BOOTHS

Refreshment booths at school fairs have not only proven themselves to be a source of revenue but they have also rendered a great service to those who find it necessary to devote the whole day to the fair. In many cases hot lunches were served in addition to the usual ice cream, oranges, bananas, etc. These booths in some instances were conducted by the children but in the majority of cases, the local branch of the Women's Institute took charge of this work, devoting the proceeds to patriotic purposes. As much as \$450.00 was realized in one county in this manner. When the war is over, it is proposed to use these funds to defray part of the expenses of the fair.

VEGETABLE GARDEN CONTESTS

It has been felt for some time that a number of boys and girls from 13

to 15 years of age who have left school would benefit greatly through having an opportunity of entering competitions in connection with the school fair work. With this in mind plans are under way to arrange for a vegetable garden contest for these children. Blue prints will be supplied to each child entering the contest showing the plan of a model garden, indicating the crops to be grown and the portion devoted to each. Seed of the most desirable varieties will be supplied in keeping with the plan supplied. During the summer months these gardens will be inspected by the district representative and prizes given for the best kept gardens. At the time of the school fair, special prizes will be given for the exhibits of vegetables grown in these gardens. While this plan has not yet been tried out, the department has every reason to believe it will be well received by the children and it is hoped it will result in a much greater variety of vegetables being grown on the farm for home consumption. Strange as it may seem town and city dwellers usually have a much greater variety of fruits and vegetables in their gardens than is found in the average farm garden. This is not as it should be and it is hoped that the garden contest will in a large measure correct this condition.

The foregoing will serve to give some idea at least of the growth and development of the school fair movement in Ontario. Insistent demands are being received for the extension of the work into new districts and where already organized both children and parents seem eager to have the work continued.

MANITOBA

BY H. W. WATSON, M.A., DIRECTOR ELEMENTARY AGRICULTURE

DURING the past two years, in Manitoba, the school fair movement has become decidedly popular. Teachers, children, trustees and parents are more and more convinced of its great value in stimulating school effort. Fully double as many school fairs were held last year than the previous year, and the interest everywhere greatly increased.

The organizing of Boys' and Girls' clubs has greatly supplemented the work of the schools and the exhibits of those organizations created the greatest interest at the school fairs. The best fairs were those that combined the exhibits of work done at school together with that done at home in connection with the Boys' and Girls' club. Contests in games and sports were held at many of the fairs; these created additional interest and enlisted the co-operation of a greater number of parents.

School Fairs held	68
Number of schools included	556
Number of pupils exhibiting, approximately	17,500
Number of adults in attendance, approximately	20,000

Exhibits in connection with the Boys' and Girls' clubs included pigs, poultry, potatoes, fodder corn, farm carpentry, bread, sewing, canned and preserved vegetables and fruits. Exhibits of school work included collections of vegetables, grains, flowers, weeds, weed seeds, insects, native woods, sewing, cooking, wood-work, compositions, maps, exercise books, drawing and writing.

Competitions were held in reading, spelling, singing and physical exercises. Inter-class and inter-school contests were also held in baseball, football, basket ball, and relay races.

Each fair was conducted by a local school fair association, which arranged all details regarding com-

petitions and prizes. The Agricultural College and the Department of Education assisted in furnishing judges in all cases.

No other movement in the schools has ever created such interest in the minds of the public as the school fair. Agricultural societies, grain growers' associations and home economic societies being all most willing to lend a hand to make them a success.

A BOY'S PIG EXPERIENCE

The following is a boy's statement of his experience in feeding pigs:

"I bought my pigs which I showed at the Children's Fair at Selkirk, October 1st, from our neighbour, Mr. C. Anderson, on the 31st of May. They were then 4 weeks and 2 days old. I put them in a dry, comfortable pen and kept them clean. I fed them on shorts and skimmed milk and what greens they would eat during the first three months, then I added a little barley chop and corn meal. I could not get much milk from this time on, so I mixed what I got with water. I kept an account of all feed at market value. I paid six dollars to Mr. Anderson for the pigs and sold them to Mr. Jameson, butcher, Selkirk, on the fair day for \$41.20. They weighed 485 pounds live weight.

"ARCHIE SMITH, age 14,

"Clandeboye.

"October 2, 1915."

COST ACCOUNT

May 31. Sack of shorts	\$1 30
May 31. Cost of pigs	6 00
July 2. Sack of shorts	1 30
Value of rope	75
Value of lettuce	25
Aug. 3. Sack of shorts	1 30
Sept. 6. Part of sack of shorts	40
Total cost for cleaning pen	1 00
Barley chop	2 00
Corn meal	1 25
Milk, 92 days at 5c. per day	4 60
Milk at times since	35

Total. \$20 50

Price received for hogs \$41. 20

Total cost. 20. 50

Net profit. \$20. 70

SASKATCHEWAN

THE Directors of School Agriculture, F. W. Bates, M.Sc., for Northern Saskatchewan and A. W. Cocks, B.Sc., for Southern Saskatchewan, report that during the year 1915 the school fair movement has made tremendous strides both in respect to number of fairs held and public interest aroused. The outstanding feature of this movement in Saskatchewan has been its spontaneity.

determination of a policy for the future: consequently no effort was made to organize new fairs, but as many of these as possible were visited and reports on the work of each obtained. In many cases the work has been undertaken by the teachers' associations, but other organizations and individuals interested in school gardening and agricultural education have given encouragement to this phase of school work, not only by



EXHIBITS FOR SCHOOL FAIR, INDIAN HEAD, SASKATCHEWAN

Prior to 1915 only four or five school fairs were held. The Carrot River School Garden association, the teachers of the Weyburn inspectorate, the Central Saskatchewan Teachers' association, and three or four other similar organizations, were responsible for the pioneer work of this movement and the fairs which were held during 1914 or in previous years.

As far as the Department of Education is concerned there has been no direct effort at systematic organization for this work during the past year, but the directors of school agriculture have endeavoured to make a study of the school fair movement with a view towards the

financial assistance but in many cases by arranging for the details of the exhibitions. A few of these are: agricultural societies, grain growers' associations, homemakers' clubs, municipal councils, boards of trustees and agricultural secretaries, ten or fifteen of whom have been very successful in arranging exhibitions for the schools of the particular municipalities in which they were engaged.

EXHIBITIONS AND THEIR MANAGEMENT

In some instances an exhibition was held for the pupils of a single school as a fitting finale to the year's work in nature study, elementary

science, school gardening and agriculture; as examples of this class are to be noted the exhibitions held at the public schools of Indian Head, Weyburn and South Weyburn and at the combined public and high school at Qu'Appelle. Mr. W. J. Stevenson, Mr. E. W. Jervis, Miss Ethel H. Ferguson and Mr. R. F. Meadows, the respective principals, were chiefly responsible for the organization of the work throughout the year and in this they were ably supported by the members of their staffs with the result that the whole work of the schools has been considerably improved. One aspect of this was the splendid tone which existed among the pupils and the practical training in civics which they received. This training was conducted by means of a school parliament, school municipal council, or a school garden club, the members of which were given certain responsibilities and thus early in life received practical training for public service.

Most of the fairs have been held for the benefit of the pupils of from four to twenty-five or more schools, while the prizes varied from university scholarships, silver cups, medals, books, garden tools, diplomas and money to some simple recognition such as badges or ribbons. When the teachers' association was responsible for the fair it was usually held at the time of the teachers' convention and thus the work was brought prominently before all the teachers of the association.

ABUNDANCE OF EXHIBITS

The greater number of fairs represented the whole range of school work, the school garden work being most in evidence. The Yorkton fair, which was organized by Mr. J. T. M. Anderson, Inspector of Schools, and the teachers of the Yorkton inspectorate, holds the record for the largest number of school districts sending exhibits. Twenty-five schools

were represented, most of these being one-roomed rural schools in districts settled by non-English speaking people. The fair at Shellbrook, a small town thirty miles north-west of Prince Albert, was the farthest north: 219 pupils, representing 15 schools, made over 1000 exhibits. Perhaps the most noticeable feature of the fair was the large exhibit of vegetables and of these 50 entries of potatoes taxed the powers of the judges to the limit. Tomatoes, ripened in the open garden, attracted much attention. Probably the largest fair from the point of view of the number of exhibitors and entries was that held at Rosthern. The eight-roomed school at Rosthern, with four other rural schools, took part. There were 390 exhibitors, who made over 2000 entries.

The best organization conducting a school fair was that of the Lost River municipality, under the leadership of Mr. J. N. Pratt, the agricultural secretary. A description of the work in this municipality will fairly well indicate what was attempted by ten other agricultural secretaries to arrange for school fairs. Each school had one acre in garden on ground previously cultivated and loaned or rented to the children. These gardens were adjacent to or across the road from the school. Registered Marquis wheat and Banner oats were obtained from the Canadian Seed Growers' association and about a quarter of an acre of each was sown in each garden. The remaining half acre was divided into individual plots. Throughout the growing season these plots were judged. Each school held a fair, the successful competitor from each becoming eligible to represent the school at the municipal fair on the following day. Here those represented entered into competition, while their respective schools competed as a unit for the school shield. The wheat from one of the gardens of this municipality yielded slightly over 66 bushels to the acre, while the

oats from an adjacent school garden gave 123 bushels to the acre. The grain was sold by auction and the money obtained thereby was given to the school for the purchase of material and equipment for the present year.

COMPETITIONS IN JUDGING

With regard to the work of the agricultural secretaries some new ideas incorporated last year are worthy of special mention. Registered grain was secured from a member of the Canadian Seed Growers' association and distributed to the boys and girls of the municipality. This grain was sown and cared for according to the regulations of the association. At many of these fairs the agricultural secretary held competitions in stock and grain judging. In each of the municipalities employing an agricultural secretary a scholarship of \$100 was presented to the boy or girl between 14 and 18 years of age obtaining the highest score in specially designated competitions. Often the agricultural secretaries were successful in arranging for a committee of the boys and girls to act as directors for the fair.

Although no system of recording has been adopted by the Department the directors are able to report 42 fairs being held in Saskatchewan during the year 1915. Two hundred and fifty schools were represented by 5,000 pupils, while approximately 7000 people attended the fairs.

As a result of their investigations the directors have been able to formulate a policy for the Department of Education according to which "Rural Education Associations" will be organized in the municipalities of the province. An effort will be made to obtain as members of these associations all teachers, school trustees, agricultural secretaries and other individuals interested in rural education generally. The chief object of these associations will be to promote and develop the use of the school garden as an educational factor. Other work will consist in the organization of school fairs, contests for boys and girls, boys' and girls' clubs, etc. In addition it is hoped that social service work will become an important part of the activities of these associations, of which a considerable number have already been formed.

ALBERTA

BY J. C. MILLER, B.Sc., PH.D., PROVINCIAL DIRECTOR OF TECHNICAL EDUCATION

AS yet school fairs, as an enterprise independent of the fairs held under the auspices of the agricultural societies and Women's Institutes, have not been developed to any extent in this province. One was held this year at the time of the autumn convention of the teachers in the Olds Inspectorate. Inspector Aylesworth and his associates are greatly encouraged by the measure of success attained in this their first effort in this direction.

AT THE FALL FAIRS

The policy of providing a definite

place for the children and local schools in the organization of the regular fall fairs held under the auspices of the agricultural societies and the Women's Institutes is adopted quite generally. In no less than fifty-four of such fairs held this year a definite place was given to the work of the children of school age and in many cases in addition to this definite provisions were made for school and class exhibits as a school or class unit. In practically every case the exhibits of the children and schools were exempted from an entrance fee and liberal prizes were offered. Exhibits of

drawing, penmanship, composition, maps, collections of wild flowers, collections of noxious weeds, bouquets of garden flowers, sewing, fancy work, are provided for in practically every instance. In a number of cases exhibits of manual arts, of various kinds of cooking, are provided for on the prize list. In several cases the school garden products are definitely listed. In Crossfield, Prisdie and Swallow the boys and girls of school age are given a place in the poultry, live stock and field crop classes. Their entries are given a class group independent of the entries of adults, and much satisfaction to the children has resulted.

The school garden work in Ponoka, and especially Taber, was helped greatly by the active and financial assistance given by the local agricultural society and Women's Institute. In both cases special classes for entries and prizes were provided on the regular organization of the fall fair for exhibits of school garden products. In Taber the Women's Institute offered prizes for the best garden plots during the growing stage and arranged for a rating of the plots on three different dates—May, June and August.

Fifty-three districts are giving a place to the work of children and the schools in the organization of their fall fairs.

BRITISH COLUMBIA

BY J. W. GIBSON, M.A., DIRECTOR, ELEMENTARY AGRICULTURAL EDUCATION

UP to the present time, no definite movement has been made to establish school fairs, our plans being somewhat different to those adopted in the other provinces. I have no doubt that school fairs are accomplishing something of value in Eastern Canada, where district representatives of the agricultural departments have been given charge of their management. In this province, however, we have not as yet and district representatives for the Department of Agriculture.

We have had in this province this year a number of school gardens and a few home gardens. There have been a few cases where exhibits were made from school gardens in connection with the regular fall fairs, and in one case at least a competition amongst the school gardens of a certain municipality, the exhibits having been made at the agricultural fair and

the awards given. The only kind of school fair that I am contemplating as yet for this province is that which we have already started in connection with a home gardening scheme, which is supervised by the teacher, and no one else. In this case, the teacher engages to visit the plots of the children at their respective homes at least once before the summer holidays and once immediately after. A regular score card is supplied and the reports sent in to me. A certain grant is given to the school board to meet such expenditures as are incurred, and, if a school's exhibition is held, a larger grant is given, part of which may be used for procuring prizes for the children. The teacher receives the same bonus for supervising the home gardening scheme and utilizing it in connection with the regular classroom work as for gardens established in the usual way at the school.

PART IV

Special Contributions, Reports of Agricultural Organizations, Notes and Publications

A RURAL FAIR IN CITY LIMITS

MANAGED AND MAINTAINED BY Y. M. C. A. BOYS ON BROADVIEW AVENUE, TORONTO

THE Broadview Branch of the Young Men's Christian Association, Toronto, is unique among such associations in Canada in so far as it pays especial attention to gardening. Established fifteen years ago in connection with the Broadview Boys' Institute, merged three years since into the Y.M.C.A., it is claimed for the Broadview Boy's Fall Fair that it is the largest of its kind in America. Whether this claim is definitely correct or not the prize list, of which six thousand copies are printed, is certainly a very comprehensive and pretentious document, comprising 52 pages with special covers and

including 22 classes divided into 320 sections.

SCOPE OF THE FAIR

The fair covers three days in the middle of September and as exhibits embraced vegetables, flowers, ponies, dogs, rabbits, covies, goats, and miscellaneous pets, pigeons, including magpies, poultry, natural history, amateur photography, drawings and paintings, industrial crafts (boats, sleds, carts, kennels, fretwork, basket work, printing, darning, model electrical apparatus, skies, snowshoes, toboggans and any other article the judges consider worthy), manual training creations, domestic science articles of food, penmanship, aeronautics (dirigible balloons, monoplanes, bi-planes, models of aeroplane or glider) and miscellaneous collections of boys' treasures, such as autographs, buttons, badges, coins, post-cards, postage stamps, crests, prize tickets, medals, college and city colours and pennants, flags from gum, war trophies and other novelties and souvenirs. Prizes in connection with the fair are also given for oratory and literature, music, boys scout exercises, swimming and athletics. The special features of the three days covered by the fair are:

Thursday evening,--grand opening, oratorical contest.

Friday evening,--swimming competition.

Saturday afternoon,--scout demonstration and contest, athletic games, pony parade and races and dog jumping in athletic field.

Saturday evening,--band concert.

The following extra exhibits are also on view:

Red Cross exhibit; safety first; health exhibit; model boy's room and library; pocket testament booth; provincial government mine and vegetable exhibits; photo demonstration; graphic arts society



H. WM. KINGLERLY

Boys' Secretary, Broadview Branch, Toronto Young Men's Christian Association

exhibit; photographs of exploration (this year some original views of the South Pole expedition).

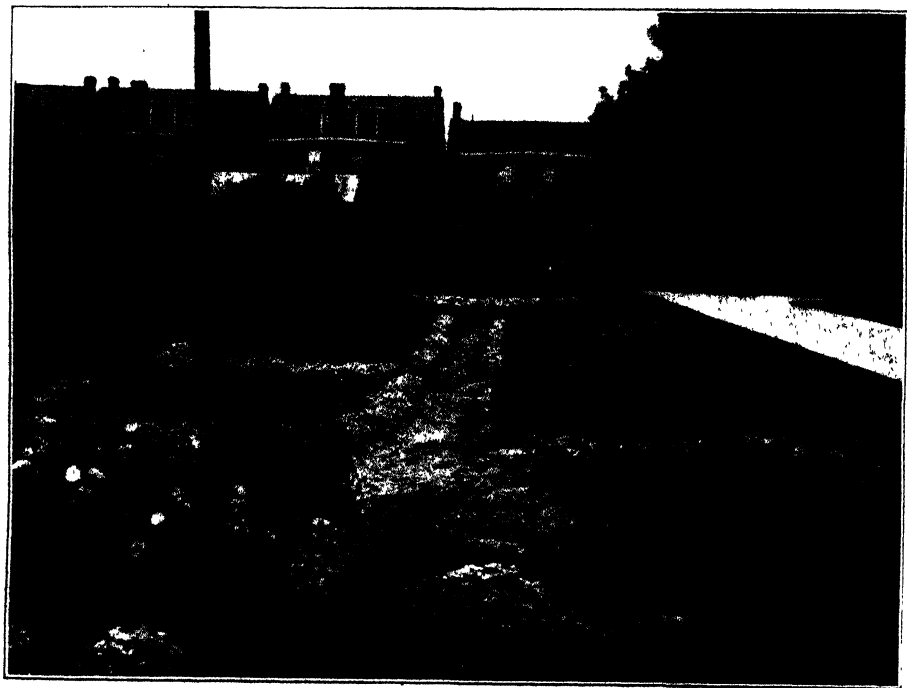
CONDITIONS AND PRIZES

All exhibitors in the competitive classes must be boys under 18 years of age. An entry fee of 10c. is charged for the first exhibit and 5c. for each subsequent exhibit. The admission fee is 25c. for adults and 10c. for children. Meals can be had on the grounds. Besides a large number of useful articles, of medals, cups, etc., five hundred dollars in cash are distributed in prizes. Cards and red, blue and yellow ribbons are also awarded.

special exhibits. Until the last few years the Ontario government made an annual grant of \$75, but although the government exhibits minerals and vegetables the grant has been discontinued.

A NATIONAL EXHIBITION

The only officials connected with "The Garden City" not appointed by the boys' council are three judges and an advisory board who are nominated by the governing board or management of the Y.M.C.A., but approved by the boys. Just as the Toronto exhibition has assumed the name of "Canadian National," so is the Broadview Boys' Fair termed "National Exhibi-



THE MUNICIPALITY IN BLOOM

MANAGEMENT AND SUPPORT

The rules provide that the boys must make their own entries and transact all their own business. In fact both what is called "The Garden City" and the fair are controlled, managed and arranged by the boys themselves, supervised by the Boys' Secretary of the branch, Mr. H. W. Kingerley. The boys have an elected city council with board of control, various committees and Mr. Kingerley as mayor. The expenses are met by the Y.M.C.A., by public subscription and from the boys' own fees. A number of business men subscribe to the prize list and give prizes for

tion of Boys' Work." Meetings are held regularly every month and on special occasions, when addresses and lectures are delivered on gardening and kindred subjects. In this connection it should be mentioned that while the small charge of two cents a package is made for seeds they are generally donated by local seed firms. Experience has taught that what the boys pay for is a great deal more valued by them and less subject to waste than when freely distributed.

EXTENT OF THE PROPERTY

"The Garden City" which was founded



SECTION SHOWING CENTRE PARK



CO-OPERATIVE WORK. THE BOY GARDENERS HELPING EACH OTHER

in 1901 by Mr. C. J. Atkinson, now field secretary of Federated Boys' Clubs of America, is located at 275 Broadview Avenue, Toronto, and on three lines of street cars. From this fact, and considering the value of land in a large city, the statement will be appreciated that the property is somewhat limited in extent. Even at that it is divided into streets, parks, avenues and squares, with a circular floral park adorned with flag pole in the centre. There are two lots situated to the west of the playground, to the north of the spacious Y.M.C.A. building, and fronting on Broadview Avenue. One is 42 by 32 feet and the other 12 by 32 feet. These are surrounded by decorative flowers and subdivided into 47 squares or gardens 10 feet by 10 feet and 10 feet by 12 feet, tilled and cultivated by 50 boys ranging in age from 10 to 16. They are devoted mainly to vegetables, the boys, as the secretary says, being more appreciative of things eatable than things ornamental. Official inspection is made and progress reported every month along with recommendations and criticisms.

RULES AND IMPLEMENT EXPENSES

Following are the rules and bill of expenses formulated and adopted by the council of boys, which is comprised of thirty directors or duly elected juvenile aldermen:

BROADVIEW GARDEN CITY

RULES PROPOSED BY COUNCIL

We propose a tax of ten cents per month on each plot. This must be paid on or before the 15th of each month, first payment to be made by May 1st to J. Rose, city treasurer. In case of non-payment of taxes property will be seized.

We propose to organize an Advisory Board consisting of at least three business men.

We propose that we meet for supper on the first Monday in each month. Supper to cost ten cents.

We propose that each citizen pay two cents for each package of seed.

We propose that each citizen do one hour's work each month to help beautify the city.

EXPENSES

Wheel barrow	\$3 00
Hoes	1 00
Fork	1 00
Rakes	1 00
Spade	1 00
Manure	1 00
Watering cans	1 00
Plants for centre of city	5 00
Mid-Summer Show	5 00
Flag	5 00
Miscellaneous	1 00
Total	\$25 00

THE ECONOMIC AND DEVELOPMENT COMMISSION

WITH a view to securing information on all matters dealt with in the Order-in-Council, constituting the Economic and Development Commission, appearing on page 1029 of the November issue of THE AGRICULTURAL GAZETTE, the Commission at the conclusion of a session held in Ottawa in December issued a statement inviting the hearty co-operation of the Canadian public in the work which it has now on hand. While the Commission

is taking steps to secure the assistance of individuals and organizations likely to be able to furnish information of value on these and other matters coming within the scope of its work, every reasonable opportunity will be accorded persons desirous of presenting written statements or of appearing personally before the Commission. The Commission is established at 22 Vittoria Street, Ottawa, where communications will be received.

BANK ASSISTANCE TO AGRICULTURE

AN Arkansas bank, realizing that through the boys and girls the fathers and mothers of the rural districts are reached, conceived the idea of assisting the boys and girls to secure live stock and other property of their own. The directors of the bank consented to the use of \$1,000 as a loan fund for the children. By means of a half-page advertisement

in the leading county papers, the bank offered to lend \$5 to any boy or girl with which to buy a calf, a pig or a pen of chickens. This loan was to be made at the rate of six per cent while the regular bank rate was ten per cent. The parent was asked to furnish another \$5 if he desired. As a result sixty boys were supplied with good pigs and sixty girls

with poultry or eggs. Through the county agent the boys and girls were instructed in the proper care of their stock by personal visits, correspondence and the supplying of government literature.

In October the bank held a fair to which were invited all the members of corn, canning, peanut, poultry and pig clubs. One girl, only thirteen years of age, had canned over four hundred cans of fruit and vegetables; another had over three hundred. One girl raised over four hundred pounds of tomatoes on one-tenth of an acre. The boys did equally as well. One boy raised eighty-seven bushels of grain to the acre. The pigs

shown were said to be the finest ever displayed at a fair in the state.

The venture proved a great advertiser for the bank and, what was more important, succeeded in introducing much improved live stock and better methods of farming generally. The bank has decided to extend this work and not to limit the loans to \$5. Only pure-bred live stock will be allowed to be purchased and an endeavour will be made to arrange a profitable market for the surplus stock. Each club member will be required to sell to a friend enough of the increase from his stock to start in the business. To meet the demand, pure-bred animals will be shipped in from other states.

A BEEF DEMONSTRATION

AT the Ontario Provincial Winter Fair held in Guelph early in December a demonstration on the importance of finishing beef cattle before selling them, was carried out. During the first two days of the fair a cross-bred Shorthorn-Hereford steer and a common unfinished steer were stalled side by side and there was displayed, in view of the public, a card giving information regarding each. At the conclusion of the second day the two steers were killed and their carcasses hung up in the dressed meat section of the fair, in full view of the public. When the carcasses were cut up the side and wholesale cuts of each were placed side by side so as to facilitate comparison. The better steer provided an almost faultless carcass; the other would be classed as about a Number 3 steer, corresponding with thousands that are annually marketed for immediate killing. The following information respecting the carcasses was displayed on cards, showed the superiority of the prime steer over the other:

PRIME STEER

	Pounds.
Live weight	1320
Dressed weight.	856

Dressing percentage.	64.9 per cent	
Weight of side		430
<i>Hind quarter:</i> Round		105
Long loin		84
Kidney suet		12
Flank		24
<i>Front quarter:</i>		
Prime ribs		48
Chuck		88
Plate		55
Shin		10

COMMON UNFINISHED STEER

	Pounds.
Live weight	1130
Dressed Weight	620
Dressing percentage	54.8 per cent
Weight of side	315
<i>Hind quarter:</i> Round	85
Long loin	50
Kidney Suet	5
Flank	12
<i>Front quarter:</i>	
Prime ribs	31
Chuck	77
Plate	35
Shin	10

CO-OPERATIVE SELLING

AT the National Conference on Marketing and Farm Credits held in Chicago early in December the Right Honorable Sir Horace Plunkett, of Dublin, Ireland, urged the American farmer to learn the first principles of selling farm products—the preparation of packages for marketing and consignment in such a way that they will be delivered regularly and under guarantee-pack. He said, in part: "The towns have flourished at the expense of the country. By the use of the townsmen's methods, the countrymen can only come into their own again, but the

form of combination which farmers must develop for their own welfare differs somewhat from the form of combination that townsmen have so successfully adopted. The farmers' form of combination should be the co-operative corporation. This kind of a corporation has for its object the development of business on a democratic basis. It contains the 'one man—one vote' principle; it limits the interest on the share capital to a moderate amount; it provides for a division of profits above this on the basis of patronage, after certain parts of the profits have been set aside for a reserve

fund for depreciation and for other necessary purposes to develop the organization to a successful growth.

"These co-operative corporations should be organized under uniform laws. They should be exempt, as in England, from the income tax, just so long as they remain non-exclusive as to membership; but they should be required by law to submit to regular audits and their accounts should be filed in some public department and be subject to inspection at any time.

"I do not think you will ever be able to get either the brains or the capital of American farmers properly applied to production until they find some means of escape from a business situation which gives them, to say the least, a precarious hold upon the profits of their industry. The way of escape is no other than co-operative organization.

"Co-operation is the best—I might almost

say—the only foundation for a rural community. It will go far to put an end to the migratory habit and to create a desire to have a permanent home and a progressive social existence. A good co-operative organizer can teach farmers how to make use of the telephone and the motor car in discussing and conducting their common affairs, and thus overcome the difficulty of distance.

"There is nothing more vital for the co-operative movement as it is today and for its future than that it should clearly sound out this note of self-help. Looking not only to the future of America, but at the movement in the old world today, his idea stirs the depths of my feelings that while the state and the voluntary movement must advance side by side, that while the state must give its aid to the co-operative movement, it must seek to secure to that movement the greatest freedom."

OBJECTS OF THE SHORT COURSE

IN an announcement of an annual course in agriculture to be held at Orillia, Ontario, under the direction of the Simcoe county Branch of the Ontario Department of Agriculture, on January 11th to February 11th, the following are given as the objects of the course:—

1. To create a deeper interest in farm life.
2. To disseminate a knowledge of the principles underlying farming operations.
3. To induce young men to inquire closely into things for themselves.
4. To acquaint them with the most advanced ideas in agriculture.

5. To encourage the reading of agricultural literature.
6. To stimulate the co-operation of farm and community.
7. To show how farm work may be made more pleasant and greater profits obtained.

The course will include studies in live stock, feeds and feeding, dairying, poultry, veterinary science, soils, underdrainage, manures and commercial fertilizers, field crops, fruit growing, weeds and insects, fungus pests, bacteriology, marketing and co-operation, farm bookkeeping and arithmetic, literary work.

Corresponding courses will be held in most of the counties of the province.

THE CROP IN THE PRAIRIE PROVINCES

The Northwest Grain Dealers' Association announces the following total yield of wheat, oats, barley and flax grown in Manitoba, Saskatchewan and Alberta, since 1902:—

CROP YEAR	Wheat	Oats	Barley	Flax
1902.....	65,000,000	38,000,000	10,080,000	500,000
1903.....	52,000,000	40,500,000	11,300,000	600,000
1904.....	57,800,000	44,600,000	10,500,000	530,000
1905.....	86,300,000	67,165,000	13,660,000	475,000
1906.....	94,500,000	75,725,000	17,000,000	1,100,000
1907.....	70,650,000	81,400,000	16,800,000	1,900,000
1908.....	95,280,000	90,200,000	20,800,000	2,500,000
1909.....	119,750,000	156,800,000	30,240,000	3,800,000
1910.....	113,250,000	128,600,000	19,400,000	3,500,000
1911.....	177,100,000	190,000,000	33,000,000	8,000,000
1912.....	176,860,000	220,327,000	31,449,000	22,000,000
1913.....	181,900,000	224,270,000	34,000,000	14,093,000
1914.....	140,031,250	162,460,000	22,690,000	4,000,000
1915 Est.....	307,230,000	389,000,000	39,292,000	2,250,000

THREE DAY DAIRY TESTS

MILKING Tests of three days' duration were held at the Ontario Winter and the Maritime Winter Fairs, held at Guelph, Ont., and at Amherst, N.S., respectively, early in December.

At Guelph, where 69 animals competed, the three year old Holstein cow, Colantha Butter Girl, owned by M. H. Haley, Springfield, Ont., won the championship award. The following records were made by the first-prize animal for each breed:—

BREED NAME	OWNER	Lb. Milk	Per cent Fat	Per cent Solids not Fat	Total Points
Holstein, Colantha Butter Girl.	M. H. Haley, Springfield, N.S.	187.4	5.3	9.57	302.13
Ayrshire, Lady Jane	A. S. Turner & Sons, Ryckman's Corner,	194.4	4.2	9.97	262.29
Shorthorn, Royal Princess	J. W. Jackson, Woodstock, Ont.	152.4	4.6	9.27	217.65
Jersey, Flora of Glenboyle	D. A. Boyle, Woodstock, Ont.	111.9	5.1	9.2	179.36
Grade, Pessie	E. H. Hilliker, Burgessville, Ont.	116.9	3.5	8.87	201.9

At Amherst 108 cows competed. The winner of 1914, Miss La Honda, again won the championship. The following records were made by the first-prize animals for each breed:—

BREED NAME	OWNER	Lb. Milk	Lb. Fat	Lb. Solids not Fat	Total Points
Holstein, Miss La Honda	S. Dickie & Son, Lower Onslow, N.S.	244	9.63	19.28	300
Ayrshire, Mona D.	McIntyre Bros., Sussex, N.B.	173.7	7.06	14.64	221.3
Jerseys, Pride	J. E. Baker & Sons, Baronfield, N.S.	134.6	6.13	12.09	189.4
Guernsey, Daisy	D. G. McKay & Sons	145.3	5.98	12.68	187.3
Grade, Annie	W. N. Boomer.	162	5.49	13.53	233.6

"The co-operative system has many advantages. It is democratic to begin with. It is free from state aid or political control or interference. It standardizes farmers' products, it prevents waste, it avoids unnecessary handling, it increases production, it improves the grades of produce. It increases the net income to farmers and decreases the cost to the consumer. It allows the future working of the law of supply and demand. It encourages competition. It increases initiative and compels an agricultural leadership."

—*Millard R. Myers, at the National Conference on Marketing and Farm Credits.*

SOCIETIES AND ASSOCIATIONS

ANNUAL MEETINGS AND CONVENTIONS

Ontario Corn Growers' Association, Essex, Ontario:—Secretary, J. W. Noble, Essex, Ontario; February 1st, 2nd, 3rd and 4th, 1916.

Manitoba Grain Growers' Association, Brandon, Manitoba:—Secretary, R. McKenzie, Winnipeg, Manitoba; January 5th, 6th and 7th, 1916.

Nova Scotia Fruit Growers' Association, Wolfville, Nova Scotia:—Secretary Manning Ells, Port Williams, Nova Scotia; January 18th to 20th, 1916.

The Alberta Provincial Poultry Association, Lethbridge, Alberta:—Secretary, W. McC. Moore, Lethbridge, Alberta; December 28th to January 1st, 1916.

The Manitoba Horticultural and Forestry Association, Winnipeg, Manitoba:—Secretary, Prof. L. A. Brodrick, Manitoba Agricultural College, Winnipeg; February 10th and 11th, 1916.

The Western Stock Growers' Association, Medicine Hat, Alberta:—Secretary (Acting), A. P. Burns, Medicine Hat, Alberta; May, 1916.

The Western Ontario Dairymen's Association, St. Mary's, Ontario:—Secretary-treasurer, Frank Herns, London, Ontario; January 12th and 13th, 1916.

The Holstein-Friesian Association of Canada, Canadian Foresters' Hall, Toronto, Ontario:—Secretary, W. A. Clemons, St. George, Ontario; February 3rd, 1916.

The Central Canada Veterinary Association, Ottawa, Ontario:—Secretary, H. S. Sparks, B.Sc., V.S., Ottawa, Ontario; January 19th, 1916.

The Saskatchewan Grain Growers' Association, Saskatoon, Saskatchewan:—Secretary, J. B. Musselman, Moose Jaw, Saskatchewan; February 15th to 17th, 1916.

The Nova Scotia Farmers' Association, Windsor, Ontario:—Secretary, Chas. R. B. Bryan, Truro, Nova Scotia; January 25th, 26th and 27th, 1916.

The Manitoba Grain Growers' Association, Winnipeg, Manitoba:—Secretary, R. Mackenzie, Winnipeg, Manitoba; January 5th, 6th and 7th, 1916.

The Manitoba Horticultural and Forestry Association, Winnipeg, Manitoba:—Secretary, F. W. Brodrick, Agricultural College, Winnipeg; February 17th and 18th, 1916.

The Dairymen's Association of Eastern Ontario, Renfrew, Ontario:—Secretary, T. A. Thompson, Almonte, Ontario; January 5th and 6th, 1916.

The third annual Canadian and International Good Roads Congress will be held at Sohmer Park, Montreal, on March 6th to 10th. Delegates are expected from all parts of Canada, Great Britain and the United States. The congress is held under the auspices of the Dominion Good Roads Association, of which Mr. Geo. A. McNamee, Montreal, is secretary. The executive committee is made up of the following gentlemen:

B. Michaud, President, Deputy Minister of Roads, Province of Quebec, Quebec.

O. Hazzelwood, Vice-President, President, Canadian Automobile Federation, Toronto.

Geo. A. McNamee, Secretary-Treasurer, Secretary-Treasurer, Dominion Good Roads Association, Montreal.

U. H. Dandurand, Past President, Dominion Good Roads Association, Montreal.

W. A. McLean, Past President, Dominion Good Roads Association, and Commissioner and Chief Engineer of Highways for Province of Ontario, Toronto.

Howard W. Pillow, President Automobile Club of Canada, Montreal.

J. Duchastel, Engineer, City of Outremont, Que.

J. A. Sanderson, Honorary President, Ontario Good Roads Association, Oxford Station, Ont.

The annual meeting of the Brandon Poultry Association was held at Brandon, Manitoba, on December 9th. Preliminary arrangements were made for the annual poultry show, which will be held on February 7th to 11th. The following officers were elected: President, N. W. Kerr; vice-president, J. F. McLean; 2nd vice-president, J. McClement; treasurer, D. Shirrif; secretary, E. H. Hebel, Brandon, Manitoba.

The annual meeting of the Western Ontario Poultry Association was held at Guelph on December 9th. The following officers were elected:—

President, Wm. Barber, Toronto; vice-president, J. E. Peart, Hamilton; 2nd vice-president, J. H. Saunders, London; secretary-treasurer, R. W. Wade, Department of Agriculture, Toronto.

SHERBROOKE COUNTY, QUEBEC, PLOUGHMEN'S ASSOCIATION

the Inspection and Sales Act, Rev. Father Leopold, La Trappe; Fruit Spurs (Illustrated), Prof. W. Lochhead, Macdonald College; Renovation of Old Orchards in Quebec, M. B. Davis; The Best Summer and Fall Apples for Eastern Quebec, J. C. Chapais; Control of Bud Moth, E. M. Du Porte, Macdonald College; Fruit Insects of 1915, C. E. Petch, Hemmingford; English Gardens (Illustrated), R. B. Whyte Ottawa.

The closing sessions of the convention and the address of Rev. Father Leopold brought forth much discussion regarding the Inspection and Sales Act, especially regarding the marking of windfalls and apples affected with scab. In nearly every fruit growing section of the province of Quebec great loss was suffered through heavy winds, nearly half of the apple crop being blown off the trees by the September winds, and immense quantities of apples, but slightly injured, had, under the classi-

fication in the Fruit Inspection and Sales Act, to be disposed of as third class, the Fruit Inspection and Sales Act classifying fruit as follows: Fancy, No. 1, No. 2 and No. 3. This resulted in considerable loss to the producers through the reduction of prices secured. The convention suggested that a special classification and marking for windfalls be instituted and that attention be given to it by the Department of Agriculture through the Fruit Commissioner.

The officers for the ensuing year were appointed as follows: President, Prof. W. Lochhead, Macdonald College; vice-president, T. A. Raymond, St. Valier; secretary-treasurer, Peter Reid, Chateauguay Basin.

Directors—R. J. Marshall, Abbotsford; G. P. Hitchcock, Massawippi; George Dickson, Rectory Hill; M. Talbot, Ste. Anne de la Pocatière; F. X. Gosselin, Ste. Famille; A. Roy, L'Ange Gardien; Rev. Father Leopold, La Trappe; Robert Brodie Montreal.

THE WESTERN CANADA IRRIGATION ASSOCIATION

THE ninth annual convention of the Western Canada Irrigation Association was held at Bassano, Alberta, on November 23rd. There were about two hundred in attendance, including delegates representing irrigated districts in Saskatchewan, Alberta and British Columbia, officials of the governments of these provinces and farmers using irrigation on their land. The meeting was presided over by the Hon. Duncan Marshall, Minister of Agriculture for Alberta. There was carried out a programme covering a variety of subjects connected with the agricultural industry.

The following resolutions were passed:

That the Western Canada Irrigation Association respectfully urge the Dominion Government to diligently proceed with the surveys in the districts indicated, so that the farming communities may be enabled to proceed to take steps to avail themselves of the benefits of irrigation without any avoidable delay.

(1) That the Dominion and Provincial Departments of Agriculture of Alberta and Saskatchewan and British Columbia be petitioned to initiate a widespread system of popular cooperative experiments with alfalfa on the basis of supplying seed to such farmers as have available well prepared and otherwise suitable areas under irrigation.

(2) Such plots to be of a minimum area of five acres and the preparation of the land, seeding, inoculation, and further treatment to be performed under the direction of departmental experts.

(3) That, at the end of the season, reports upon these plots, properly illustrated, be published and mailed to all holders of irrigable lands.

(4) That a well directed and energetic educational propaganda be initiated by the Departments of Agriculture to convince settlers on irrigated lands generally that the only road to complete success lies, through the alfalfa field, into the breeding and feeding of live stock.

That this convention urge strongly upon the Dominion Government, and the Government of the Province of British Columbia, the importance of making the necessary appropriation and providing the necessary staff to continue, without interruption the work of gauging all streams of water supply.

The following officials were elected:

Honorary President:—Honourable W. J. Roche, Minister of the Interior, Ottawa.

President:—Honourable W. R. Ross, Minister of Lands, Victoria, B.C.

Honorary Vice-Pres:—J. S. Dennis, Assistant to the President, C. P. R., Calgary.

1st Vice-President:—Honourable Duncan Marshall, Minister of Agriculture, Edmonton.

2nd Vice-President:—Honourable Senator Bostock, Ducks, B.C.

Secretary:—Norman S. Rankin, Calgary, Alta.

Executive Committee:—

F. Maurice Smith, Penticton, B.C.

James Johnstone, Alderman, Nelson, B.C.

J. L. Brown, President, Agricultural Society, Kamloops, B.C.

W. E. Scott, Deputy Minister of Agriculture, Victoria, B.C.

F. H. Peters, Commissioner of Irrigation, Department of the Interior, Calgary, Alberta.

R. A. Travis, Secretary, Board of Trade, Bassano, Alberta.

G. R. Marnoch, President, Board of Trade, Lethbridge, Alberta.

Joseph Dixon, Maple Creek, Saskatchewan.

There was held, in connection with this convention, lasting three days from November 23rd to 25th inclusive, an exhibition of soil products grown on irrigated and non-irrigated land. The products exhibited included alfalfa, various grasses, fall and spring wheat, coarse grains and flax, potatoes, sugar beets and other field and garden vegetables.

The convention for 1916 will be held at Kamloops, B.C.

ANNUAL CONVENTION OF BEE-KEEPERS' ASSOCIATION

THE annual convention of the Ontario Bee-keepers' association was held in Toronto, on Nov. 23rd to 25th, 1915. There was a large attendance, and the interest and enthusiasm were well maintained.

The President, Mr. J. L. Byer, Markham, occupied the chair. In his address he drew particular attention to the heavy winter loss of 1914-15. "Inferior stores gathered from the hard maple the previous season seems to have been the cause of most of the loss." Where feeding was necessary and ordinary attention given the bees, the losses were almost normal. The crop of honey was good from Toronto west, and light from that point east. The demand has been exceptionally keen, and generally speaking the prices recommended by the crop report committee have been received. The bee diseases—both American Foul Brood and European Foul Brood—must receive greater attention. While the spread of the former may be well in hand, the ravages of the latter were greater than ever. Individual efforts could do much to fight the disease.

A resolution was passed to the effect that the executive committee, Mr. D'Arcy Scott and Mr. J. D. Evans, petition the Dominion Government to take measure to control the importation of bees from diseased districts.

Dr. E. F. Phillips, in charge of bee culture investigations, U.S. Department of Agriculture, Washington, D.C., read a paper on "Temperature and Humidity in the Hive in Winter." His experiments proved that the winter loss of colonies was due to two causes:—(1) Lack of stores and (2) excessive heat production. The bees generate heat at the expense of their vitality when the outside temperature is too hot or too cold.

Views of large apiaries in all parts of the United States illustrated "Some Bee-keepers of the United States" by Dr. Phillips. The work of the late L. L. Langstroth, Moses Quinby, and Dr.

C. C. Miller was mentioned. Mr. F. W. L. Sladen, Dominion Apiculturist, Central Experimental Farm, Ottawa, spoke about his recent investigations on "Honey Production from the Golden-rods and Asters."

The subject of "Outdoor Wintering" was presented by Mr. H. G. Sibbald, Toronto. His methods were to make preparations for winter and let the bees winter themselves. Strong colonies with lots of young bees, plenty of stores and sufficient packing are essentials. As it costs little more to make a 4-hive case than a one-hive case, and the warmth of one colony helps the other, he uses the quadruple case with three inches of planer shavings for packing. The apiary of course, is in a sheltered location.

The short course in Apiculture at the Ontario Agricultural College, apiary inspection and summer demonstrations, and the results of some tests with appliances were mentioned in the "Brief Summary of the Year's Work," by Mr. Morley Pettit, Provincial Apiarist, Guelph. An average of 32 was reported for the 60 apiary demonstrations conducted in all parts of the province the past season.

Addresses were given by Mr. F. W. Krouse, Guelph, on "Summer Protection and Swarm Control," and by Mr. G. A. Deadman, Brussels, on "Apiary Appliances." Mr. Krouse showed the advantage of protecting the bees in the summer by leaving them packed in their winter cases the entire year.

Considerable discussion followed Prof. L. Cæsar's paper on "Poison Sprays and Poison Baits." It was his opinion that the sweetened bait poisons used for grasshoppers, army and cut-worms would not be injurious to the bees. Two resolutions followed this address. The first, asked the Provincial Apiarist to conduct experiments to prove the effect of scattering such sweetened poisons, and the second, that the fine in the present act against spraying fruit trees in full bloom be not less than \$25, nor more than \$100. Messrs. J. D. Evans, McIn-

tyre and Ross were appointed to bring these matters before the provincial government.

The directors selected the following officers for 1915-16:—President, F. W.

Krouse, Guelph; 1st Vice-President, Jas. Armstrong, Selkirk; 2nd Vice-President, W. W. Webster, Little Britain; Secretary Treasurer, Morley Pettit, Guelph.

HOLSTEIN-FRIESIAN RECORDS

MR. W. A. CLEMONS, secretary of the Holstein-Friesian Association of Canada, reports that from October 1st to November 30th, 1915, twenty-one cows and heifers qualified for entry in the Record of Performance. Artis Rosie, owned by the Nova Scotia Agricultural College, Truro, leads the mature class with 751.25 lb. butter from 16,818 lb. milk. Doris, owned by the Hospital for Insane, Hamilton, Ont., is second with 750 lb. butter from 17,826 lb. milk. In the four-year-old class Canary Violetta Mechthilde, owned by J. M. Steves, Steveston, B.C., stands first with 722.5 lb. butter from 15,568 lb. milk. Lilith Pauline Calamity Jane 3rd owned by J. M. Steves, Steveston, B.C., makes a record of 898.75 lb. butter from 19,802 lb. milk and takes second place for Canada in the three-year-old class. The highest two-year-old is Lena of Pleasant Valley, owned by N. Sangster, Ormstown, Que., with 567.5 lb. butter from 13,874 lb. milk.

Mr. Clemons also reports that during

October and November the records of thirty-three cows and heifers were accepted for entry in the Record of Merit. In the mature class, Highland Ladoga Mercena, owned by James G. Currie, Ingersoll, Ont., comes first with 27.95 lb. butter. In the senior four-year-old class Midnight Comet DeKol, owned by James G. Currie, Ingersoll, Ont., made a record of 34.98 lb. butter in seven days, giving her second place in her class for all Canada. Jessie McN. of Crystal Spring, owned by D. A. McPhee, Vankleek Hill, Ont., with 15.68 lb. butter is the only junior four-year-old. In the three-year-old class Daisy Ormsby Less, owned by Arbogast Bros., Sebringville, Ont., leads with 24.64 lb. butter. Het Loo Clothilde, owned by Dr. L. de L. Harwood, Vaudreuil, Que., is best senior two-year-old with a record of 23.21 lb. butter while Forest Ridge Segis Inka, owned by Dr. A. A. Farewell, Oshawa, Ont., is the highest junior two-year-old with 14.84 lb. of butter.

NEW PUBLICATIONS

THE PROVINCIAL DEPARTMENTS OF AGRICULTURE

QUEBEC

MACDONALD COLLEGE

Macdonald College Short Courses, 1916. This is a pamphlet of 13 pages giving the particulars of short courses that are to be held in Live Stock, Field Crops, Poultry Horticulture, Farm Engineering and the Farm Home during January at various points in the province, and on Horticulture, Poultry and Dressmaking at Macdonald College during the present winter.

ONTARIO

Crop Bulletin 125.—Summarized reports are given of the year's yield in the province of every kind of crop with comments and remarks from many districts. A dozen pages are devoted to tables showing by counties the acreage and production of all grains, vegetables and hay, clover and alfalfa, the number of horses, cattle, sheep, swine and poultry on hand July 1st, 1915,

and the number of live stock sold or killed in Ontario up to June 30th.

Municipal Bulletin No. 9.—This 32 page bulletin contains statistics of the population in 1915, of the assessed values in 1914, the taxation, debenture debts and sinking funds of every municipality in the province, arranged by counties. In 1915 the population of Ontario was 2,598,320, an increase of 59,455 compared with 1914. The population of the townships increased in the year 19,828, of the villages 3,424, and of the cities 36,203.

Bureau of Industries, Annual Report, 1914.—Part I is devoted to agricultural and weather statistics with a review of the crop conditions in the province at various times in the year, and tables showing by counties the acres of assessed land, the acres cleared, the acres of woodland, of slash land and of swamp or waste land, and the yields and market values of crops in the aggregate and by annual averages; also of the live stock, farm property, and products of the cheese factories and creameries. Part II is com-

prised of one page telling by counties of the number of farm mortgages and the amounts involved.

Report of the Stallion Enrolment Board 1915. This pamphlet of 96 pages constitutes a record of the stallions enrolled throughout the province during the year. The total number enrolled was 3,177, of which 2,155 were pure-bred and 1,022 were grades. Forty-nine prosecutions under the Act are reported resulting in 36 convictions. Where the offence was not wilful sentence was suspended.

ALBERTA.

Department of Agriculture, Annual Report, 1914.—Very full and complete and especially well arranged is this rather bulky volume of 296 pages. It contains concise accounts of the work of every division and branch of the department with statistical tables on an extensive scale and some appropriate illustrations. The annual reports and financial statements of the various breeders' associations and other agricultural societies are all given in detail in the appendix with lists of prize winners. A noteworthy feature of the Deputy Minister's report is the statement that many people attracted by the boom in real estate and other speculative movements who migrated to the cities and towns have now returned to the land. "In addition to those who left the land for a good excuse and have now gone back again," says the Deputy Minister, "there were many others who through lack of employment were compelled to return. The people of the province are realizing as they never did before that the soil is the greatest producer of wealth there is and that life on the farm offers possibilities little thought of during the last few years. It is to be hoped that the lesson, severe as it may have been, will be the means of establishing on the land a class of people who will stay, realizing that it is the best place to earn a comfortable living, to grow a family and to make a home, for that after all is the main purpose of any man's work." Progress is noted in every line of agriculture, especially in dairying. Lists are given of the secretaries, with their addresses, of the agricultural societies, of exhibitions and fairs, and of the Women's Institutes. Particular attention is paid to the schools of agriculture and their work, complete lists of the students being supplied. A large increase in the destruction of big game is reported by the Chief Game and Fire Guardian despite an increase of restrictions.

BRITISH COLUMBIA

Annual Report of the Department of Agriculture for 1913 and 1914. This is a book of 152 pages and constitutes a report

of the Department's activities during the two years. The work is dealt with under the heads of Statistics, Imports, Inspection, Exhibition and Publicity Work, Experimental Work, Packing Schools, Short Courses, Field Crop Competitions, Farmers' Institutes, Women's Institutes, Fruit Growers' Association, Stock Breeders' Association, Dairymen's Association, Agricultural Societies, Agricultural Fairs Associations, Cow Testing Associations, Poultry Feeding Stations, Demonstration Farm Work, Alfalfa Investigations, etc. The report is generously illustrated.

MISCELLANEOUS

The National Domain in Canada and its Proper Conservation, by Frank D. Adams, Ph.D., D.Sc., Dean of Faculty of Applied Science, McGill University, Chairman of Committee on Minerals, Commission of Conservation. This is a 48-page pamphlet composed of Doctor Adams' presidential address before the Royal Society of Canada in 1914. Included are a couple of maps showing the physiographic divisions and distribution of forests in Canada and a series of descriptive diagrams and appropriate and especially interesting illustrations. As might be expected the address is replete with information about Canada and its resources, not omitting those of agriculture and especially of forestry. A significant sentence in the address is made after referring to the exhaustion of the land that is going forward in the western provinces. "In view of these facts," Dr. Adams remarks, "It is a matter for sincere congratulation that in parts of Manitoba and Alberta, as well as in our eastern provinces, more attention is being given to mixed farming."

The Temperature and Precipitation of British Columbia, by A. J. Conner, M.A., Climatologist of the Meteorological Service, published under the direction of R. F. Stupart, F.R.S., Canada, Director of the Meteorological Service, chief office, Toronto. In a prefatory note to this 90 page 11½ by 8¾ inches blue book Mr. Stupart announces that this is the first of a series of booklets in which all the data arising from meteorological observations in Canada during the last seventy years or more will be analysed and published province by province in synoptical form with comment. The present publication is devoted to British Columbia and will be followed by a similar work dealing with the data of the North-western provinces. It contains plain and coloured maps and charts and tabulated statistics of the monthly, seasonal and annual means and extremes in temperature and precipitation of every district in British Columbia.

Directory of the Milling Industry of Canada. This is a little book 5 inches by 8 $\frac{1}{4}$ inches of 116 pages, compiled by E. S. Bates, editor of *The Canadian Miller and Cerealist*, and published at a dollar, by the Industrial and Educational Press, Limited, Montreal. It contains alphabetical lists of flour mills, cereal mills,

grist mills and chopping mills indexed as to provinces, towns and names. It also gives the customs tariff and fourteen or fifteen pages of statistics regarding the yield and value of wheat, oats, barley, rye, peas, mixed grains and flax in Canada as a whole and by provinces.

BOOK REVIEWS

Soils and Manures, by F. J. Russell, Director of the Rothamsted Experimental Station, Harpenden; Cambridge Farm Institute series; Cambridge, at the University Press, 1915; 206 pages, 5 $\frac{1}{2}$ inches by 8 inches.

The preface of this book starts with the evident truth that unless a man understands the principles of soil management he will not be very successful in the crop part of his work. Such knowledge, it further says, can be acquired by experience, but there is a royal road in study. It is to help the student along this road that this work has been prepared. It is divided into three parts, the first being "An Account of the Soil," the second treating of "The Control of the Soil" and the third dealing with "Fertilizers." While written entirely from knowledge and experience of British soil the principles sought to be inculcated are common the world over. In other words there is herein much useful information to be obtained by any reader with understanding. The section devoted to fertilizers is especially valuable in its analysis of the effect of animal manure.

The Brown Mouse, by Herbert Quick, author of "On Board the Good Ship Earth." Publishers, McLeod and Allen, Toronto; 310 pages; illustrated.

As Harriet Beecher Stowe's "Uncle Tom's Cabin" started a wave that ultimately swept human slavery from the United States republic, so this story should, if allowed free reign, give impetus to the wiping out of the unprofitable old-fashioned rural school on this continent. The hero, a farm hand, who had spent his leisure hours with good authors and farm bulletins, rather by accident than purpose became the teacher of an Iowa rural school. On

entering upon his scholastic duties "Jim Irwin" neglected to use the prescribed text books, but in their stead seized upon the farm life of the district as text to fit the pupils for their life's work.

"To be sure, there were on the blackboards exercises and outlines, of lessons in language, history, mathematics, geography and the like. But these were not the usual things taken from text-books. The problems in arithmetic were calculations as to the feeding value of various rations for live stock, records of laying hens and computation as to the excess of value in eggs produced over the cost of feed, etc. In one corner of the room was a typewriting machine, and in another a sewing machine. Instead of the usual collection of text-books in the desk, there were hectograph copies of exercises, reading lessons, arithmetical tables and essays on various matters relating to agriculture, all of which were accounted for by two or three hand-made hectographs—a very fair sort of printing-plant—lying on a table . . ."

After much protest the parents and trustees had forced upon them the conviction that the study of life in the school, represented in the testing of seeds and milk, computing rations, etc., would carry the whole district to a higher plane, and so there was ultimately organized with the full co-operation of the populace a rural centre with the school as the hub which served as class rooms, manual training rooms, laboratories, theatre, moving picture hall, nursery, and what-not, taking the place of several neighbouring schools where sections had been consolidated. The story, realistic and interesting, breathes the spirit of the new rural school that has already made its appearance in some parts of Canada.

NOTES

On December 16th, by Order-in-Council, the exportation of hay was prohibited to all destinations abroad other than the United Kingdom, British possessions and protectorates, France, Italy, Japan and Russia, except Baltic ports.

Professor J. B. Reynolds, president of the Manitoba Agricultural College, announces the following recent appointments to the staff of the college: A. J. Galbraith, specialist in soil survey; William Southworth, specialist in plant breeding; F. S. Jacobs, professor of Animal Husbandry and E. W. Wood, lecturer in Animal Husbandry. Professors Galbraith and Southworth were secured from the staff of the Ontario Agricultural College; the former was lecturer in chemistry and geology and the latter lecturer in field husbandry. Professor Jacobs, a graduate of the Ontario Agricultural College in the nineties, was until recently editor of *The Farm and Ranch Review*. Mr. Wood, a graduate of MacDonald College, occupied the position of County Agent in Dakota, prior to his new appointment.

Fourteen country editors in the state of Illinois have banded together and announced that each of them will devote a page a week to those subjects that can arouse the readers of their papers to a general sense of their relationship to each other and the importance of making the most of life and of the advantage of so working as to give each to himself all of the self help that is needed to make him a success in the world of endeavour. This page will contain suggestions gathered from the world of co-operative effort effecting every phase of rural improvement—credits, cooperation, business features etc. It is expected to prove and to convince that increased production, well marketed, is the salvation of the country side.

Earthworms: Mr. John Murray, the British publisher in a recent lecture related the following incident in regard to Charles Darwin:—

"Mr. Murray, I have brought a manuscript. It has cost me five years' hard work, and has interested me, but I cannot think the public will take much interest in it."

My father said: "I like to hear an author talk like that. What is the subject of your book?" "Earthworms," replied Darwin.

That book went through five editions in about as many months.

"In the final analysis, no one is going to solve the farmer's problem for him. He must do that for himself. The problems are fundamentally economic and must be based upon sound principles of business and finance. Hence co-operation becomes the key-note, working, as it does, for results in the standardization of products, and in the hopes for a system of finance that will do for farm business what the banks have done for commercial enterprises."—*Frank L. McVey, at the National Conference on Marketing and Farm Credits.*

In the December number of *THE AGRICULTURAL GAZETTE*, page 1203 the total attendance at Agricultural and Veterinary colleges and schools in Canada was given as 2,056. This total should have read 2,164, which includes 58 first year and 50 second year students at the Ontario Veterinary College omitted from the summarized table.

In an article "Proving Methods by Results—Why Parents Should Support Agricultural Instruction," in a recent edition of *The Canadian Countryman*, Elizabeth Crone, speaking of the "School Fair," writes as follows.—

"Now, you may ask, what has all this got to do with the pupils' other school work—does it not tend to lead to its neglect. In reality it does not overshadow the other school work, but gives it new life. For instance, the arithmetic, which consisted mostly of brain puzzlers from books, becomes, to the children, practical work which calls into use the hand as well as the mind, and the problems seem more like the kind Dad gives them at home and which they could not do. They can appreciate the use of oral composition, because it consists of real speeches in real meetings, and they know that some day they will want to speak at the Farmers' Club and the Women's Institute. The written composition is more interesting because it is on live every-day subjects. It even works into the geography lesson. For instance, in studying the products of Europe they may learn that millet is grown in many lands and right out there in the garden they are growing varieties from six of those countries. And it is interesting to the children to look up the countries in which the different breeds of farm animals and poultry originated."

INDEX TO PERIODICAL LITERATURE

- Potash in Agriculture,
B. C. Aston, F.I.C., *Journal of Agriculture*, Wellington, New Zealand, October 20th, 1915, page 283.
- The Opportunities of the Cereal Breeder,
C. R. Klinck, B.S.A., *The O. A. C. Review*, Guelph, Ont., November, 1915, page 73.
- The Year of Plenty,
Prof. John Bracken, University of Saskatchewan, *The Grain Growers' Guide*, Winnipeg, November 24th, 1915, page 7.
- Your Steers for the Spring Market,
Live Stock Editor, *The Farmer's Advocate & Home Journal*, Winnipeg, November 24th, 1915, page 1421.
- How the Farmers Met the Business Interests,
H. Bronson Cowan, *The Farm & Dairy*, Peterboro, Ont., November 25th, 1915, page 3.
- Western Canada's Wheat Crop,
Mr. E. F. Hutchings, *The Monetary Times*, Toronto, November 26th, 1915, page 28.
- Business Methods in School Administration,
Norman F. Black, M.A., Paed., *The Prairie Farm & Home*, Regina, Sask., November 27th, 1915.
- The Green Apple Bug on Apples and Pears,
W. H. Brittain, Provincial Entomologist for Nova Scotia, *The Canadian Horticulturist & Beekeeper*, Peterboro, December, 1915, page 269.
- A Full Day at the Poultry Department,
Ontario Agricultural College, Guelph, The Editor, *Canadian Poultry Review*, Toronto, December, 1915, page 411.
- Investigations in Cereal Crops and Lessons Therefrom,
G. H. Cutler, B.S.A., Professor of Cereal Husbandry, University of Saskatchewan, Saskatoon, *The Saskatchewan Farmer*, Moose Jaw, Sask., December, 1915, page 5.
- The Foundation of Agriculture,
Jas. E. Poole, Union Stockyards, Chicago, *The Grain Growers' Guide*, Winnipeg, December 1st, 1915, page 14.
- Seed Selection,
Seager Wheeler, Rosthern, Sask., *The Grain Growers' Guide*, Winnipeg, December 1st, 1915, page 19.
- Consider the Sheep,
J. McCaig, *The Grain Growers' Guide*, Winnipeg, December 1st, 1915, page 20.
- The Fundamental Basis of Co-operation,
Dr. T. N. Carver, Professor of Economics, Harvard University, *The Nor'-West Farmer*, Winnipeg, December 6th, 1915, page 1004.
- Homemaking on the Prairies,
W. J. Rutherford, Dean of Agriculture, University of Saskatchewan, *The Grain Growers' Guide*, Winnipeg, December 8th, 1915, page 8.
- Impressions Gained from a Round of the Fall Fairs,
Prof. H. Barton, Macdonald College, Que., *Farm & Dairy & Rural Home*, Peterboro, December 9th, 1915, page 1036.
- Agricultural Land Values Determined by Profits,
The Monetary Times, Toronto, December 10th, 1915, page 5.
- The Romance of the Wheat,
Norman Patterson, *The Canadian Courier*, Toronto, December 11th, 1915, page 6.
- The Day of Opportunity for Canadian Poultrymen.
W. A. Brown, B.S.A., Dominion Live Stock Branch, Ottawa, *The Canadian Countryman*, Toronto, December 11th, 1915, page 3.
- Fate and Effect of Arsenic Applied as a Spray for Weeds,
W. T. McGeorge, Chemist, Hawaii Agricultural Experiment Station, *Journal of Agricultural Research*, Washington, D.C., December 13th, 1915, page 459.
- Beef Production in the West,
Prof. Kenneth McGregor, B.S.A., Iowa State College, Ames, Iowa, *The Grain Growers' Guide*, Winnipeg, December 15th, 1915, page 9.
- The Development of the Consolidated School,
Richard Lees, M.A., *Farm & Dairy & Rural Home*, Peterboro, December 16th, 1915, page 5.
- How I Succeeded with My School Fair,
Miss A. Stafford, *Farmer's Advocate & Home Journal*, Winnipeg, December 15th, 1915, page 1561.

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DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE

The Agricultural Gazette of Canada

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CONTENTS.

	PAGE
1915 and 1916.	109

PART I

DOMINION DEPARTMENT OF AGRICULTURE

The Dominion Experimental Farms:--	
The Division of Cereal Husbandry:	
The New Cereal and Agrostology Building, by G. G. Moe.	110
The Entomological Branch:	
The Introduction and Establishment in Canada of the Natural Enemies of the Brown-tail and Gipsy Moths, by J. D. Tothill.	111
Notes	116
The Health of Animals Branch:--	
Orders Respecting Foot and Mouth Disease, Imports of Animals, etc	117
The Levis Animals' Quarantine Station, by J. A. Couture	118
The Dairy and Cold Storage Branch: --	
Peach Precooling, by Edwin Smith	121
The Live Stock Branch:--	
Encouragement to Breeders, by John Bright	123

PART II

PROVINCIAL DEPARTMENTS OF AGRICULTURE

The Production of Vegetable Seeds:	
Prince Edward Island, by Theodore Ross	126
Macdonald College, by T. G. Bunting	127
Manitoba:	
Growing Vegetable Seeds, by F. W. Brodrick.	128
Production of Field Root Seed, by Prof. T. J. Harrison.	129
Sweet Clover: --	
Nova Scotia, by John M. Trueman	130
Quebec, by I. J. A. Marsan	130
Ontario, by C. A. Zavitz	130
Sweet Clover as a Honey Plant, by Morley Pettit	132
Saskatchewan, by John Bracken	132
Alberta, by W. J. Stephen	135
Nova Scotia:--	
Opening of New Science Building at College of Agriculture	136
Quebec:--	
The Progress of Agriculture, by H. Nagant.	138
Teaching Poultry Breeding, by Brother M. Ligouri.	139
School Fairs in the District of Bedford, by Emile A. Lods.	141
Ontario:--	
Acre Profit Competitions in 1915, by C. F. Bailey	141
Feeding Hogs for Profit Competition.	145
Apiculture Short Course.	146
Notes from District Representatives, supplied by C. F. Bailey	147
Manitoba:--	
Seed Fairs and Poultry Shows, by George Batho.	149
Notes.	150

Saskatchewan:—	PAGE
Sequence of Annual Crops at Saskatoon, by John Bracken	152
The Royal Commission on Live Stock	154
Live Stock Distribution	154
Poultry Marketing	156
Soil Moisture Tests.	156
A Dairying Lecture Train	156

British Columbia: -	
Boys' and Girls' Clubs or Junior Farmers' Institutes	157
Fruit Packing School at Duncan	157

PART III

RURAL SCIENCE

School Gardens:—	
Nova Scotia, by L. A. DeWolfe	158
Quebec, by J. C. Magnan	159
Ontario, by J. B. Dandeno	160
Manitoba, by H. W. Watson	161
Saskatchewan, by A. W. Cocks	163
Alberta, by J. C. Miller	169
Edmonton City Schools	170
British Columbia, from last year's report of J. W. Gibson	175

PART IV

SPECIAL CONTRIBUTIONS, REPORTS OF AGRICULTURAL ORGANIZATIONS, NOTES AND PUBLICATIONS

Agricultural Meteorology in Canada, by R. W. Mills	177
Bank Assistance to Agriculture	179
A County Improvement League	181
The National Association of Audubon Societies	182
The Marketing of Farm Products, by Charles J. Brand	183
How Should Science be Taught	184
Why Experts Leave Us	185
Rural School Reform	185
Russian Government Agricultural Agency	185
Stallion Enrolment in 1915	186
Societies and Associations	186
New Publications.	194
Book Reviews	197
Notes	198
Index to Periodical Literature	200

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OF CANADA

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1915 AND 1916

THE response by the farmers of Canada to the Empire's call for increased production in 1915 was a total net output exceeding one billion dollars, an increase over normal years of at least three hundred millions. It may be well to call attention to a few things in connection with this.

There were other provinces than the three Prairie Provinces that "did their bit." Every province in Canada shows a substantial increase over 1914 as may be seen in the special report in THE AGRICULTURAL GAZETTE for January. Permit one illustration: The Okanagan Valley in British Columbia sent 1,400 men to the front by July, 1915, out of a total population of 15,000, and then more than doubled the value of the food production. The three Prairie Provinces contributed probably nearly one-half of the total product.

The wheat crop was worth \$310,000,000, and accounted for about 30 per cent of the total agricultural product. Other things counted also. Look at dairying. In Ontario the dairy production was increased 20 per cent and prices were over 10 per cent ahead of 1914. Other provinces shared in the increase, especially Alberta, Saskatchewan, Quebec and Nova Scotia. The dairy cow was "on the job" in 1915. So also were the beef cattle, the pigs, and the hens.

It is not fair to the farmers of the prairies to call the wheat crop of 1915 merely a "freak" crop. One western paper calls it the "miracle" wheat crop. The farmers cultivated more land and gave attention to their seed. Providence gave them favourable weather. Then they toiled early and late in the harvesting and threshing. Good cultivation gave bigger yields than careless work, 45 bushels as against 25.

If all other classes do their duty as did the farmers in 1915 all will be well with Canada and the Empire. And the farmers must renew their efforts, for the problem is greater.

The question now is.—What of 1916?—*C. C. James.*

PART I

Dominion Department of Agriculture

INFORMATION SUPPLIED BY OFFICIALS OF THE VARIOUS
BRANCHES REPRESENTED

THE DOMINION EXPERIMENTAL FARMS

THE DIVISION OF CEREAL HUSBANDRY

THE NEW CEREAL AND AGROSTOLOGY BUILDING

BY G. G. MOE, B.S.A., ASSISTANT TO THE DOMINION CEREALIST

THE erection of a new building for the Divisions of Cereals and Agrostology at the Central Farm, to replace the one destroyed by fire last July, has proceeded rapidly. The building will probably be ready for occupation in a few weeks.

Owing to the greater space required by both divisions, the new structure is somewhat larger than the one it replaces, extra rooms being required by the Agrostology Division and for the transfer of the baking work from the main office. The old building erected in 1911 was of a plain design 40 x 70 feet. The new building is 40 x 90 feet, of a very harmonious design, made with a balloon frame and square pitched roof. The exterior finished with planed lumber and battens, with shingles on the upper story, presents an attractive appearance, while the interior finishings of matched wood harmonize well with the general design of the building.

A large commodious basement will be principally used for the storage of implements. The ground-floor, with a hall extending for forty feet from the centre of the north end,

is divided into five rooms. A room principally for the selection and bagging of seed, sixteen by twenty-four feet, is situated on the north-east side of the building. This is the main working-room in the winter, where most of the seed grain is looked over and bagged. Next to it is situated the fanning mill room, sixteen by sixteen feet, having connections with the bagging room and the threshing floor. In this room will be placed only the small hand mills, electric fan, etc., for cleaning the grain from the plots and small strips. In the north-west end a room sixteen by twenty-four feet will be used by the Agrostology Division for cleaning and selection purposes. On the west side of the hall, next to the threshing floor, a room sixteen by twenty feet will contain the stationary grain-cleaning machinery. The large mills placed in this room are used for the cleaning and grading of large lots of grain for distribution purposes. These are operated by electric power from a main shaft in the threshing room, which supplies power to all the mills and machinery from a motor in the basement. A large portion of the ground-floor

must of necessity be reserved for the threshing and storage of grain. Allowance has been made for a floor fifty by forty feet, the driveway being situated next to the fanning rooms. In the winter this space will be used for the storage of large lots of seed.

The second floor is divided into a writing room, milling and baking rooms, rooms for the selection of plants and the smaller lots of grain, a granary and agrostology rooms. These last comprise three rooms on the north-west side of the building and will be used for selection work and the finer work of the division. On the north-east side is placed the

writing room, the milling and baking rooms and the plant inspection room. The seed selection room, twelve by sixteen feet, is next to the Agrostology rooms on the west side, the remaining space on the second floor being used as a granary for the storage of the small lots of seed from the breeding plots and field test work. The rooms are lighted throughout by large double windows.

With the installation of the most modern equipment essential in carrying out the rapidly expanding work of both divisions, the building should be a material aid in the better prosecution of the agronomy work of the experimental farm system.

THE ENTOMOLOGICAL BRANCH

THE INTRODUCTION AND ESTABLISHMENT IN CANADA OF THE NATURAL ENEMIES OF THE BROWN-TAIL AND GIPSY MOTHS

BY J. D. TOTHILL, B.S.A., FIELD OFFICER, DOMINION ENTOMOLOGICAL LABORATORY,
FREDERICTON, N.B.

IN the last issue of THE AGRICULTURAL GAZETTE, Mr. L. S. McLaine described the methods employed for rearing and shipping to Canada large numbers of some of the natural enemies of the gipsy and brown-tail moths. Through the efforts of the Dominion Entomologist, Dr. C. Gordon Hewitt, these natural enemies have in the past four years been colonized in various places in Eastern Canada. It is the purpose of the present article to speak of the colonization and principles we have had in mind in carrying out the distribution in Canada of these natural enemies.

The gipsy and brown-tail moths are not native to this continent; they have both come from Europe. In their native land they are largely controlled naturally by various agencies that prey upon them. In the process of crossing the water barrier between the two continents some of the most important of these agencies

were left behind. With fewer enemies to contend with the insects have become far more insidious pests than they had ever been in their native land.

Introduced near Boston, Mass., the two insects have spread in all directions but more rapidly in the direction of the prevailing winds, that is towards Canada. The brown-tail moth reached Canada some years ago and is now thoroughly established in Nova Scotia, and New Brunswick is reinfested from year to year just so often as favourable winds occur at the time of flight; it will reach the province of Quebec with the first favourable wind at this same critical time of flight. The gipsy moth has not yet reached Canada but must almost certainly cross the international boundary within the next few years; a glance at the map on page 113 shows its present proximity.

The two insects are thus spreading rather rapidly north. One is already

in Canada, the other is expected annually. In their northward march the climatic and other conditions for existence become more rigorous. Sooner or later they will arrive at a point where the climate and conditions are too rigorous for their successful existence, and at this point they will cease to be injurious.

Just where this northern barrier will be is not known and can only be known from actual observation as the insects travel northward. It is certain, however, that both insects will find favourable conditions in the "transition" zone of Canada, that is, in the warmer parts of the Dominion. The northern forests of Canada are, however, largely on the colder "boreal" zone and these may or may not be attacked. A certain forecast is impossible but Mr. F. H. Mosher, of the United States Gipsy Moth Laboratory, has shown that there are plenty of trees in our northern forests upon which the gipsy moth caterpillars will feed voraciously. There is consequently a probability that at least the gipsy moth, the more injurious of the two, may find a favourable environment in the boreal forest. It is needless to say that a disaster to our forests would be national in character.

It is largely as a measure of protection from such a disaster that so much energy is being expended in establishing a living barrier of animals that feed upon these two insects.

To explain why these particular animals are being introduced the various agencies as factors of control governing these two host insects (gipsy and brown-tail moths) may be briefly considered. They may be conveniently tabulated in the following way:

Climatological:	}	catastrophic
temperature		
rainfall		
winds		
Food supply		
Parasites:		
protozoa		
bacteria		
fungi		

insects	}	non-catastrophic
Predators:		
insects		
birds		

The catastrophic agencies are extremely important in controlling insects; they are at work in all lands; with a few exceptions they cannot be modified or encouraged by man.

The non-catastrophic agencies are, for insects like Lepidoptera, also of the greatest importance; amongst them the insect parasites and predators can be distributed from one place to another by man.

In Europe all these agencies are at work helping to destroy these two injurious insects and consequently, the outbreaks of the pests are few. In North America all are at work except the insect parasites and predators, and the outbreak of the pests is a continuous one.

Of all these factors the insects are only ones that increase and decrease directly as the hosts increase and decrease; they are consequently the great regulators of control.

Such in brief are the reasons why these insect parasites and predators are so important in maintaining the natural balance, in preventing outbreaks and consequent destruction in forest and shade tree areas.

Where these creatures have been colonized may be seen on the accompanying map.

The object has been to establish the barrier of living insect enemies at strategic points. These are the Canadian points nearest to the area at present infested with the two host insects, and nearest to trade routes.

The map shows that southern Quebec near the New Hampshire and Vermont boundary is of strategic importance. Likewise that New Brunswick is altogether too close for comfort to the black line bounding the gipsy moth area. It also brings out the fact that as Nova Scotia occupies an isolated position the danger of either insect spreading



MAP SHOWING DISTRIBUTION IN CANADA OF INSECT ENEMIES OF THE GIPSY AND BROWN-TAIL MOTHS

from it to other parts of the Dominion is relatively slight; it should be remembered, however, that this Province is already infested with the brown-tail and that introduction of the gipsy moth is liable to be brought about at anytime on account

of the constant coastwise trade between New England points and Nova Scotia.

The following table shows where these parasites and predators have been liberated since the inception of the work in 1912.

DISTRIBUTION OF PARASITES AND PREDATORS IN CANADA

NUMBER OF INDIVIDUALS LIBERATED

SPECIES	Locality	1912	1913	1914	1915
<i>Compsilura concinnata</i>	Fredericton, N.B.	1,238	1,238	1,500	
	St. Stephen, N.B.	1,119	1,500		
	Nerepis, N.B.		1,500		
	Woodstock, N.B.			1,500	
	Harvey, N.B.			2,000	
	Keswick, N.B.				1,800
	Bear River, N.S.		1,500		
	Annapolis Royal, N.S.				1,500
<i>Calosoma sycophanta</i>	St. Stephen, N.B.	42	100		
	Whittier Ridge, N.B.		100		
	St. George, N.B.			100	
	Nerepis, N.B.			100	
	Fredericton, N.B.			100	
	Marysville, N.B.			100	
	St. Leonard, N.B.			100	
	Perth, N.B.			100	
	Florenceville, N.B.			100	
	Woodstock, N.B.			100	
	Canterbury, N.B.			100	
	Lawrence, N.B.			100	
	Harvey, N.B.			100	
	Scotch Ridge, N.B.			100	
	Basswood Ridge, N.B.			100	
	Bear River, N.S.			100	
	Annapolis, N.S.			100	
	St. Rose, P.Q.			100	
	Sherbrooke, P.Q.			100	
	Revoirs Corner, P.Q.				100
	East Hereford, P.Q.				100
	Dixville, P.Q.				100
	Coaticook, P.Q.				100
	Beaver Meadow, P.Q.				100
	North Troy, P.Q.				100
	Mansonville, P.Q.				100
	Stanstead, P.Q.				100
<i>Calosoma</i>	Apple Grove, P.Q.				100
	Way's Mills, P.Q.				100
	Digby, N.S.				100
	Weymouth, N.S.				100
	Metaghan, N.S.				100
	Yarmouth, N.S.				100
<i>Meteorus versicolor</i>	Whittier Ridge, N.B.		475		

SPECIES	Locality	1912	1913	1914	1915
<i>Apanteles lacteicolor</i>	Whittier Ridge, N.B.		4,499		
	Basswood Ridge, N.B.		7,000		
	St. Stephen, N.B.		7,000		
	Nerepis, N.B.		3,391		
	Woodstock, N.B.		2,000		
	Bear River, N.S.		7,000		
	Dixville, P.Q.				2,000
	Coaticook, P.Q.				2,000
	Beaver Meadow, P.Q.				2,000
	Way's Mills, P.Q.				2,000
	Rosborough, N.B.				2,000
	Poquiock, N.B.				2,000
	Keswick, N.B.				2,000
	Fredericton, N.B.				2,000
	Lincoln, N.B.				2,000

The two-winged Tachina fly *Comptosilura* (vide the figure in the previous article) has not yet been recovered in numbers from the field.* No attempt to recover it will be made until it has had an opportunity to become thick enough to enable recoveries to be made without great expense. The method of recovery will consist in collecting large quantities of native caterpillars in which the larvæ of the parasite feed. These will be fed in trays so as to rear the parasites, or will be dissected. One of the most convenient insects to collect for this purpose is the common cabbage caterpillar.

The beetle *Calosoma* is not expected to increase rapidly until the favourite food, the gipsy moth, becomes abundant. No attempt has been made to recover the species, but in spite of this a fine specimen was ploughed up last spring in a field in New Brunswick in which it had happened to go to earth for the winter. Later on attempts at recovery will be made on a larger scale. The method is based on the tree climbing habit of the larvæ. The larvæ cast their skins periodically and leave them attached to branches and trunks of trees. By examining carefully all the trees within distance of

beetle colonies the moulted skins can be found and the numerical status of the species ascertained.

The small four-winged-fly, *Apanteles lacteicolor*, is increasing rapidly in Canada. The method of recovery may be of interest. The parasite winters as a tiny larva in the hibernating brown-tail caterpillars in the winter webs; in the spring these parasitic larvæ develop rapidly and kill their respective caterpillar hosts; they then crawl or wriggle out of the caterpillars and spin silken cocoons that are white in colour and easily seen. On these points are based the methods of recovery. The winter webs of brown-tail caterpillars collected during the survey of all infested territory are saved. In the spring these webs are placed in trays and the emerging caterpillars fed. In two weeks or so the cocoons of the parasite appear in the trays. These are picked out and counted and the remaining unparasitised caterpillars burnt.

In this way it has been shown that the insect has been steadily increasing in numbers in all the places in Canada in which it has been introduced.

In Nova Scotia *Apanteles* has done particularly well. Mr. G. E. Sanders, the Field Officer of the Branch for the Province, has developed an

*A single specimen was recovered from the Fall Webworm (*Hyphantria cunea*) in 1912 the first season of liberation.

ingenious and successful plan for assisting the local distribution of the parasite. The winter webs are saved and placed in the spring in large open-air cages placed at points at which new colonies are desired. The caterpillars are fed until the parasites have issued. In this way Mr. Sanders has been able to distribute thousands of these parasites.

In Massachusetts, owing to the foresight of the Chief of the Bureau of Entomology, Dr. L. O. Howard, and to the untiring energies of Mr. W. F. Fiske, Mr. A. F. Burgess and other assistants, these insects have been naturalised for some years and are now making themselves felt as factors in the control of their two imported hosts.

The farther north the hosts travel the smaller is the percentage of parasitism and predatism necessary for control, for the catastrophic factors assume a large rôle. By the time the gipsy moth reaches Canada it is quite possible that a living wall of natural enemies will have been built of sufficient strength to prevent a repetition in Canada of the serious conditions brought about by the introduction of this pest into the New England States.

In conclusion it should be said that these parasites can never become injurious in themselves for the reason that their digestive systems are adapted only for feeding in or upon other insects.

NOTES

The Dominion Entomologist, Dr. C. Gordon Hewitt, has been elected President of the American Association of Economic Entomologists. At the recent meeting of the Entomological Society of America held at Columbus, Ohio, Dr. Hewitt delivered the annual address.

In December the Branch was fortunate in being able to have the assistance for about eight days of Dr. J. M. Aldrich of the United States Bureau of Entomology, who is the leading authority on the North American Diptera or two-winged

flies. Dr. Aldrich rendered the Branch valuable help by working over the collections of Diptera.

The death took place in November last of Mr. Colborne Wright, who had held the position of Superintendent of the Fumigation station at Windsor, Ont., for sixteen years, and was one of the oldest officers of the Branch. During the whole of his period of service Mr. Wright was not absent from duty for a single day. By his death the Department has lost a conscientious and valued officer.

A few rural districts have shown a creditable interest in beautifying their school-grounds, but the movement is not at all general. One too often sees the school-grounds unfenced, ungraded, and littered with paper, chips, etc. The summer course in rural science should result in more teachers taking an active interest in persuading the trustees to clear, grade and fence the school-grounds, so that the cultivation of small plots of flowers and vegetables may be undertaken by the children. Inasmuch as school gardening lends itself readily to co-relation with other subjects of study, particularly arithmetic, drawing, geography, nature-study, and elementary handwork, it would seem reasonable that the simplest way of creating interest in these subjects would be by means of the school garden.—*John Martin*, Inspector of Schools, British Columbia.

THE HEALTH OF ANIMALS BRANCH

ORDERS RESPECTING FOOT AND MOUTH DISEASE, IMPORTS OF ANIMALS, ETC.

UNDER the provisions of "The Animal Contagious Diseases Act," for the period of three months from January 8th, 1916, the following regulations will govern the importation into Canada of animals or their products, or of hay, straw, fodder or manure from the state of Illinois:—

(1) Cattle, sheep, goats and swine are prohibited.

(2) Horses may be admitted upon the receipt of a special permit from the Veterinary Director General. Owners should make application for a permit before shipping.

(3) Dogs, other than those used for herding cattle or sheep, may be admitted; also cats, pet birds, live pigeons, and wild or menagerie animals, except deer.

(4) Live poultry is prohibited, except birds for exhibition or pure bred poultry for breeding.

(5) Cured and cooked meats, butter and eggs may be imported.

(6) Dressed meats, fresh or cured, with the exception of heads, tongues and feet, will be admitted when accompanied by the export certificate of the Bureau of Animal Industry (and consigned to an establishment under federal inspection).

(7) Hides must be accompanied by a certificate of disinfection signed by an officer of the Bureau of Animal Industry. Less than carloads will not be admitted.

(8) Pickled pelts of sheep and goats, also skins of wild fur-bearing animals, tanned or untanned, may be admitted.

(9) Tanned sheep and goat skins with wool attached must be accompanied by certificate of disinfection signed by an officer of the Bureau of Animal Industry.

(10) Wool may be admitted under the following conditions:—

(a) When accompanied by a certificate of disinfection signed by an officer of the Bureau of Animal Industry.

(b) Pulled wool, scoured and dried at a temperature of not less than 160° F. and accompanied by affidavit of shipper to that effect.

(c) Foreign wool, ex-warehouse in Illinois, in original bales, and accom-

panied by affidavit of warehouseman that it has not been in contact with other wools.

(11) Hair and feathers may be admitted when accompanied by certificate of disinfection by an officer of the Bureau of Animal Industry.

(12) Hay, straw, other fodders and manure are prohibited.

(13) Fragile merchandise packed in hay or straw must be accompanied by a certificate, signed by a Bureau of Animal Industry officer, that the packing material has been disinfected. In default of this, permission may be granted by the Veterinary Director General for the delivery of the goods on the undertaking of the importer to burn the packing material as soon as received.

(14) Importation of live animals and their products, also hay, straw and other fodders, from any other State than the state of Illinois is permitted under the ordinary regulations of the Department of Agriculture, but the shipper may be required, if deemed necessary, to produce evidence that the shipment did not originate in the state of Illinois.

Dated at Ottawa, this eighth day of January, nineteen hundred and sixteen.

(Sgd.) GEO. F. O'HALLORAN,
Deputy Minister of Agriculture.

— — —
The Order under "The Animal Contagious Diseases Act," of date the 8th day of January, 1916, is hereby amended by adding thereto the following paragraph.—

"(15) Sterilized manure may be permitted transit through Canada from points in Illinois to destinations in the United States, provided it is contained in bags, boxes or barrels, and shipped in sealed box cars, and accompanied by a certificate of sterilization signed by an officer of the Bureau of Animal Industry."

Dated at Ottawa this seventeenth day of January, 1916.

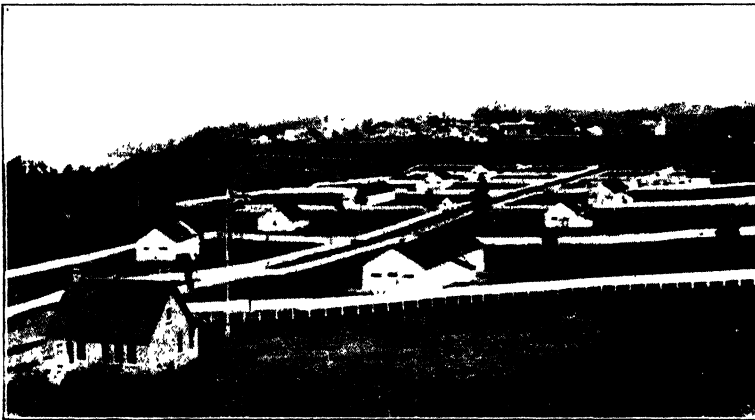
(Sgd.) GEO. F. O'HALLORAN,
Deputy Minister of Agriculture.

THE LEVIS ANIMALS' QUARANTINE STATION

BY DR. J. A. COUTURE, VETERINARY SUPERINTENDENT

THE Levis animals' quarantine station is the oldest in North America and the most important of this country. It was established in 1876 on a very small scale. Fort No. 3 served the purpose until 1880. It was then found necessary to take possession of some 40 acres of government land around the fort, where accommodation was made for over 500 cattle and 1000 sheep. The establishment would have been perfect had it not been that the animals had to walk on the public highway on going from the steamer to the quar-

the level of the river and overlooking the splendid heights of the north shore, the Citadel, the Plains of Abraham, Spencer Wood, the residence of the lieutenant-governor, etc. About 25 acres of the property is occupied by a little mountain covered with trees. There is also a most valuable quarry. The remaining portion may be divided in four sections, namely: The lower section on a level with, and contiguous to, the Intercolonial railway, with which it is connected by a spur track and which is reserved for the reception of



VIEW IN ANIMALS' QUARANTINE, LEVIS
Office building in foreground

antine station. No practical way having been found to overcome that which had always been a serious danger of contamination of the live stock of the country, the present place was purchased in 1913 and the quarantine station removed thereto.

DIMENSIONS OF THE STATION

The present station comprises 127 acres of land on the south shore of the St. Lawrence, about three miles west of the previous station, most of which is from 80 to 140 feet above

the animals. The first plateau is 85 feet above the preceding section, and occupies the border of the cliff, where are situated the residence of the foreman, the workshop, the waiting room for the cattlemen, the horse stable and the cartsheds. About 50 feet higher up is the second plateau, where is the office from which the whole establishment may be seen, as well as most of the cattle barns, the sheep barns and the aqueduct system. Some 15 feet higher up again is the third plateau contiguous to the mountain, surrounded by

trees and deep gullies isolating it from the rest of the establishment. This will be used for suspicious herds. The whole place is admirably adapted for quarantine purposes, plenty of trees, plenty of stone for road-making, plenty of water, sun and pure air. It would be difficult to find a more wholesome and more beautiful place in the country. The establishment is not completed yet, nor will it be for some time, but just as it is it answers all quarantine purposes.

LOCATION AND EQUIPMENT

A well-graded road, 30 feet wide, leads from the lower part to the second plateau, which it divides into two parts, on both sides of which are most of the cattle barns. The latter

CAPACITY

The station can accommodate 432 cattle, 250 fat or show sheep and about 1000 field sheep. There are 2 sheep barns, one holding 100 sheep and the other 50. There are 17 cattle barns, varying in size and accommodating from 4 to 60 head each. Every cattle barn is arranged to be converted into a sheep barn and can easily be made to accommodate swine.

The reason for having sheds of different sizes is obvious. Each lot of animals must be kept by itself and a lot may consist of a single animal, or of just a few, or of from 20 to 30, which is the most common, to 50 or 60. Hence, the present ar-



VIEW IN ANIMALS' QUARANTINE, LEVIS

are 200 feet apart with adjoining yards varying in size according to the number of animals which can be accommodated in the barn. Each shed is separated from the neighbouring structure by an alley 30 feet wide. The establishment is illuminated by electric arc light, all the large sheds being also so provided. The water is supplied from an artesian well, 207 feet deep, over which is a compressed air tank automatically filled by a $\frac{1}{2}$ h.p. electric motor. The water is thus sent by air pressure to the sheds and yards.

range ment which consists in 1 shed for 4 cattle, or three times that number of sheep; 2 sheds for 8 head each; 1 for 12, 1 for 15, 1 for 16, 2 for 20 each, 1 for 22, 2 for 25 each, 1 for 27, 1 for 30, 1 for 40, 2 for 50 each, and 1 for 60.

The station has 30 buildings, comprising an office, three residences for the permanent staff, horse stable, cart shed, work shop, waiting room for cattlemen, lime house, tank house, boiler house, hay barn, implement shed, 17 cattle barns and 2 sheep barns.

THE STAFF AND THE METHODS

The staff consists of the Veterinary Superintendent, Dr. J. A. Couture, a resident foreman, a night-watchman and two other employees. During the season of navigation there is a temporary staff of from 10 to 20 men, according to circumstances. The station also owns four cattle cars for the conveyance of the live stock to and from the quarantine.

The veterinary superintendent is notified twelve hours in advance of the arrival of a steamer carrying live stock and of the kind and number thereof. Arrangements are then made to have the cars on the Intercolonial railway wharf at Levis, where the animals must be landed. The veterinary superintendent makes a preliminary inspection of the animals and of their health papers. That being done, and no contagious disease being found, the animals are walked from the ship to the cars and transported by the Intercolonial railway to the receiving section of the quarantine, unloaded and walked, by the incoming way, to their quarters. There is an incoming way and an outgoing way, so as to prevent animals leaving the station after their probation from passing on the road used by those which may have come some time before and which might be affected with contagious diseases.

Once in the quarters assigned to them the animals remain isolated till the end of the probation. None but the officials and the man in charge are allowed therein. The probation

being finished, and having proved satisfactory, the animals are taken by the outgoing way to the quarantine cars and conveyed to the Levis station for their destination. On the three last days of probation the cattle are tested with tuberculine and the reactors are marked.

DIMINUTION OF IMPORTS

The frequent outbreaks of foot and mouth disease in Great Britain during the last five years and the present war have considerably diminished the importation of live stock into this country through the Levis quarantine station. Thus, in 1915, there were imported only 144 cattle, 70 sheep and 2 swine. That is a poor record compared to what it has been, especially during the three decades extending from 1880 to 1910. The figures herewith given may be of interest to the readers of THE GAZETTE. During the decade 1880-90 the number of cattle imported through the Levis station varied from 148 in 1887 to 2,130 in 1888, and the number of sheep from 473 in 1884 to 1,994 in 1888. For the decade 1890-1900 the number of cattle varied from 1 in 1897 to 257 in 1899, and the number of sheep from 180 in 1896 to 3,023 in 1891. For the decade 1900-1910 the number of cattle varied from 48 in 1905 to 522 in 1900, and the number of sheep from 227 in 1903 to 3,332 in 1909. Since the establishment of this quarantine station in 1876, 52,125 animals have been admitted, comprising 12,644 cattle, 37,888 sheep, 1341 swine, 186 goats and 66 reindeers.

Arthur C. Shuttleworth, Ph.D., for twelve years chemist at the Ontario Agricultural College, died at High River, Alberta, early in January, at the age of fifty-five years. An account of Dr. Shuttleworth's career will appear in the next issue of THE AGRICULTURAL GAZETTE.

THE DAIRY AND COLD STORAGE BRANCH

PEACH PRECOOLING

BY EDWIN SMITH, B.Sc., OFFICER IN CHARGE OF GRIMSBY PRECOOLING AND EXPERIMENTAL COLD STORAGE WAREHOUSE

THE experience of horticulturists with tender fruits has been that the peach is one of the most difficult fruits to ship long distances. To market peaches on the Canadian prairies requires from seven to fourteen days from the time the fruit is picked till it reaches the consumer. To successfully hold the peach this length of time it must be shipped under refrigeration. It has been found that in ordinary refrigerator car shipments it requires 3 days to reduce the temperature of the peaches to 45 degrees. Decay in the fruit results before actually coming under refrigeration. This situation has demanded that the fruit be pre-cooled.

RESULTS OF PRECOOLING

The first shipment of pre-cooled peaches was made to Boissevain, Manitoba, and consisted of the Yellow St. John variety, which is one of the more tender shippers of the yellow-fleshed peaches. The fruit was packed in the Northwest Standard box and pre-cooled to 40 degrees Fahr. The shipment required eight days, arrived at its destination in splendid condition and was sold profitably without the loss of a peach.

Other shipments followed to Winnipeg, Brandon, Saskatchewan, the farthest western shipment being made to Prince Albert, Sask. On all shipments where the peaches were brought to the plant in a satisfactory condition the best of results followed, the peaches arriving in very good condition.

SUCCESSFUL SHIPMENT TO GLASGOW

On the 29th of September the Grimsby Fruit Growers Ltd. were making a pre-cooled shipment of pears to Glasgow. They complied with the suggestion to furnish Elberta peaches sufficient for the Department's staff to pack 15 boxes in the ordinary commercial manner. These were included in the shipment and arrived in Glasgow in good condition fourteen days afterward, the peaches selling at retail for 4d. and 6d. each.

Several eastern shipments were made as far as St. John, N.B., including some peaches that were becoming well advanced toward ripeness.

EXPERIMENTAL CARS

The Department purchased fruit for two experimental cars to test and demonstrate packages and also pre-cooling. One of these cars included 855 boxes of Early Crawford peaches. These peaches were becoming well advanced toward ripeness at the time of picking, and in order to make up the carload, part were held under refrigeration eight days before shipping, and were five days in transit to Winnipeg. The shipment gave perfect satisfaction as reported by Mr. A. H. Flack, Chief Fruit Inspector for the Prairie Provinces. The other experimental car shipped to Winnipeg contained Elberta peaches in four different packages, the Michigan bushel, Woolverton crate, Hunter crate (both 6-qt. and 11-qt. baskets) and the Northwest box. The test showed

TEMPERATURES OF PRECOOLED CARS OF PEACHES

The low and even temperatures of cars of precooled fruit may be seen in the thermograph record herewith shown, when compared with the record which was made in a car shipped to the West on the same day without precooling. These records show a good average of temperature conditions in cars of fruit precooled and not precooled.

DEGREE OF MATURITY OF PEACHES FOR PRECOOLING

For successful shipment for pre-cooled peaches the fruit must be picked when "medium ripe", i. e., when the fruit is mature yet not ripe. With the Elberta peach this stage is reached when the ground colour is turning yellow and the blush is advancing to a good splash of red, yet when the fruit is perfectly firm. This

is usually two or three days before the peach would be ripe if left on the tree.

The peach is not truly a cold storage fruit, so that particular care must be used in handling it at the ripening stage. If allowed to be placed under refrigeration when ripe, contrary to common opinion, its quality becomes mealy, dry and worthless. On the other hand if picked too green it will never advance in colour, quality or flavour. Perhaps no fruit loses its flavour so quickly under refrigeration as the peach, and although it is possible to hold certain varieties of peaches for several weeks as far as firmness is concerned, it is impossible to conserve the flavour this length of time. This is important in making peach shipments in order that as much despatch as possible may be secured in their shipment and distribution.

THE LIVE STOCK BRANCH

ENCOURAGEMENT TO BREEDERS

BY JOHN BRIGHT, LIVE STOCK COMMISSIONER

OWING to the heavy drain upon their live stock, the various warring countries of Europe are forced to look abroad for supplies. The longer the war lasts the greater will be the necessity for this. Moreover, when peace is restored, these countries will require increased numbers of the various classes of animals to replenish their studs, herds, and flocks. It should be borne in mind, however, that the buyers who come to this country after the war will require a better class of animal than has been bought during war time, as the animals purchased then will be used to a greater extent for breeding purposes.

With this end in view, the best of the females, and particularly the young stock, should be retained for breeding purposes. By following

this course breeders will be in a position when the time comes to meet the assured demand. At present, however, there is an unequal distribution of live stock in Canada. In certain sections there is a heavy surplus, with a corresponding scarcity in other parts. During the past year hundreds of young cattle from the Prairie Provinces have gone to the United States as stockers and feeders. Many of these should have been kept at home, particularly the females. In sections of Ontario there is an over supply of this particular class which could be advantageously distributed elsewhere. In order to improve existing conditions, the Minister of Agriculture has decided to grant, through the Live Stock Branch, liberal aid to breeders who wish to better their stock. The con-

ditions under which aid will be given are as follows:

In the event of a number of farmers in any district of Canada wishing to co-operate for the purchase of stock in car-load lots from some distant section of the country, the Department will pay the travelling expenses of their duly appointed representative during the time required to effect the purchase and transport the shipment to its destination.

Should it be desired, the Live Stock Commissioner will nominate a suitable person who will be directed to accompany this representative and assist him as far as possible in buying and shipping the animals.

Persons wishing to take advantage of this offer should make arrangements with the Live Stock Commissioner as to place and time of purchase before sending out their representatives.

AN ILLUSTRATION OF SUCCESSFUL CO-OPERATION IN THE MARKETING OF EGGS AND POULTRY

BY ERNEST RHOADES, B.S.A.

SEVERAL years ago the farmers in the vicinity of Lansdowne, Ont., organized a farmers' club. This club looked after the marketing of eggs, the buying of seed corn, and the buying of clover seed. From this small or embryo organization grew the Lansdowne Farmers' Association, which during last year bought and sold for its members some fourteen thousand dollars' worth of produce, over twelve thousand dollars' worth of which represented eggs and poultry.

In 1910 the marketing of eggs was really commenced. Eggs were handled on a half cent margin, and every three months the profits accruing from the business transacted were divided amongst the members. The eggs were shipped to Montreal dealers, and in some cases direct to the consumer.

In 1913 the present Farmers' Association commenced operations with a definite constitution and by-laws and a membership of twenty-five. This grew to one hundred and thirty the following year, when 26,309 dozen eggs were sold, having a gross value to the association of \$6,636. Last year the membership rose to one hundred and fifty, and the eggs marketed amounted to 38,777 dozen, having a gross value to the association of \$8,525. All eggs are candled on receipt, and where a special trade is being

catered to, the eggs are graded in accordance with the "Standards for Canadian Eggs." In the spring of 1915 the operations of the association covered Lansdowne, Gananoque, South Lake, Caintown, Lyn and Mallorytown.

For the last three years the collector has gathered in addition to eggs, all the poultry the members had for sale, some of which was crate fattened, and some sold alive, according to the state of the market. Any birds unsuited to marketing in either of these ways have been put on to range and improved in condition. The association has crate fattening accommodation for three hundred and fifty birds. In addition to fowl, turkeys are bought up in the district and sold on the Christmas market.

The association encourages the breeding of pure bred poultry of good laying strains, a premium being paid during the hatching season for fertilized eggs from pure bred flocks; these eggs are sold to farmers who wish to improve their poultry. On the other hand, during the summer season a premium of one cent per dozen was paid for unfertilized eggs. The number of birds on the farms of the members in and around Lansdowne now average from seventy-five to one hundred.

Poultry grit, oyster shell, incubators and hovers were bought and

sold to members during last year valued at over three hundred and thirty dollars; and over a hundred dollars' worth of seed corn was purchased.

Nearly five hundred dollars' worth of cheese was bought and stored, being sold to local stores as old cheese. As this was bought at fourteen and a half cents a pound and sold at nineteen cents, the transaction resulted in considerable profit to the association.

The association has grown and reached the stage where some adequate form of financing is necessary,

and at the annual meeting held on January 6th last it was decided to incorporate the association, with a capital of \$5,000, to be subscribed by the members in shares of twenty-five dollars each, the payments to cover three years.

A re-organization of the association provides for a considerable extension of activities which necessitates the appointment of additional officers, the most important of which is that of a sales-manager, who will devote the greater part of his time to the organization.

AGRICULTURE FIRST IN CANADA

The basic source of Canadian permanent development and prosperity still is agriculture. As an industrial country we have made considerable progress. Industrial plant has been speeded as a result of the war. Aside from the war order business, the industrial plant of Canada is of great importance but it depends upon agriculture.

We need more population. But there is chiefly one place for it—upon the land, producing wealth. If men will not farm, it is wasted energy to turn factory wheels. Factories and mills have sufficient equipment to look after the maximum demand likely to arise for many years to come. But a few hundred thousand new-comers to the Western Prairies, to Northern Ontario, to British Columbia and to the Maritime Provinces, having made up their minds to be farmers and having commenced to produce from the soil, would make a vast difference.

The best crops in the history of Canada were harvested last year. In 1913, the value received from our field crops, forests, mines and fisheries, was \$907,311,000; in 1914, \$975,380,006, and last year \$1,123,169,000.

Too much emphasis cannot be placed upon the necessity for still further production. That is the Dominion's primary work. In doing it, we not only will help ourselves greatly, but will also help to maintain the position and prestige of the British Empire in the world's affairs.

As pointed out on another page by Dr. C. C. James, Dominion Agricultural Commissioner, there is no doubt that the crop of 1915 will leave a good margin of profit to Canadians, despite high ocean rates. The value per acre of our wheat in 1910 was \$11.17. Last year it was \$20.71.—*The Monetary Times*.

PART II

Provincial Departments of Agriculture

THE PRODUCTION OF VEGETABLE SEEDS

PRINCE EDWARD ISLAND

BY THEODORE ROSS, SECRETARY FOR AGRICULTURE

ABOUT 30,000 lb. of vegetable seeds are used annually on Prince Edward Island, much more than half of which is turnip seed. It is practically all imported. The prospective scarcity of these seeds for the year 1916 and for sometime thereafter, occasioned by the disorganization of seed production operations in the European countries engaged in the present great war, makes their production a matter of considerable importance.

This subject was brought to the attention of the Provincial Department of Agriculture by the Maritime Representative of the Dominion Seed Branch, Mr. S. J. Moore, and a plan of campaign outlined. The following circular letter was sent to all the Farmers' Institutes in the Province, setting forth the conditions and asking that the subject be discussed at one of their first meetings.

SECRETARY,
FARMERS' INSTITUTE.

Dear Sir,—

We are in receipt of a communication from the Representative of the Seed Branch at Ottawa setting forth a difficulty that will arise probably by occasion of the war. At the present time, nearly all the vegetable seeds are imported from France, Germany, Belgium and Holland, and, as most of these countries are engaged in the war, the prospect is that the growing of them will be discontinued, or at least hindered to a very great extent. This

will not interfere with the supply for 1915, but will for 1916, and probably for future years.

The Seed Branch is accordingly encouraging the growth of seeds by offering bonuses as per enclosed circular.

We would be obliged if you would take this matter up at one of your first meetings and have it as fully discussed as possible.

This Department will accumulate all the information possible on this subject and send it to the Press, so that I do not think there will be any difficulty about information regarding the growing of the seed next spring.

Yours very truly,

(Signed) THEODORE ROSS,
Superintendent Farmers' Institutes.

The circular referred to in the foregoing communication read as follows:—

Dear Sir,—

From information gathered by the Seed Commissioner at Ottawa, it appears that we are facing a famine in Field Root and Garden Seeds for 1916.

It has been the custom in the past for seedmen and farmers of Canada to depend almost entirely on Great Britain and the European countries for the annual supply of these seeds. As conditions exist to-day, and are likely to be for some time to come, that supply is liable to a large extent to be cut off.

Last year to encourage the production of home grown root and vegetable seed, the Dominion Department of Agriculture offered subventions of so much per lb., on the different vegetable seeds grown in the Dominion: mangels, 3c; turnips 4c; carrots, 7c; garden beets, 10c; parsnips, 7c; radish, 9c; cabbage, 25c; etc. Only a few farmers in Nova Scotia, Yarmouth County,

availed themselves of this bonus on about 1,500 lb. of turnip seed. Two seed farms and two farmers in Ontario were paid subventions on mangels, beet and other garden seeds, the whole only a drop in the bucket compared with our needs.

The district of the Maritime Provinces has been asked to produce seed of mangels, 67,500 lb., turnips, 45,000, carrots (field), 2,400; radish, 600; parsnips, 300; cabbage, 225; cauliflower, 15; beet (garden), 900; carrot (garden) 150. All these, except mangels, are grown successfully in the provinces and in some districts no doubt they may be grown.

The mother plants for the production of these should be selected and stored this fall. The only care is to select well-shaped medium-sized roots or plants. If the tops are cut, they should not be cut too close, as that is sure to destroy the crown or centre from which the plant should start next year. They are kept through the winter in either a cool cellar or pitted in the field, but where there is liable to be very much zero weather a cool cellar is preferred. Under the circumstances, what will you do to help us? Will you agree to have one-quarter or one-half or more acres of some of the seeds? If you do not feel like producing any for the trade, at least try some for your own use. When the seed is inspected and the subvention paid, it will be advertised in pamphlet form by the Seed Branch.

Kindly let us hear what you are prepared to do.

S. J. MOORE,
Seed Branch Representative.

The co-operation of the Department of Education was also enlisted. The Superintendent sent a letter to each of the school inspectors and made the growing of vegetable seeds one of the four home projects on which a teacher could qualify for a

bonus. A quantity of informative literature was also circulated through the public press.

The result of the campaign among the farmers it is hard as yet to estimate. Quite a number undertook to grow sufficient turnip seed for their own use, but I have no idea how many. Seven farmers tried it commercially, but with indifferent results, about 200 lb. of seed in all being offered for sale by them.

On November 8th a circular letter of similar import to that sent to the farmers' institutes, was addressed by the Superintendent of Education to all school inspectors, the superintendent adding that he was of the opinion that the subject would make particularly good and profitable "Home Projects" work for the school children, and that he would like the matter taken up with the teachers. A few days later a circular letter was addressed to each of the teachers who reported the growing of vegetable seeds as part of this work. Replies received showed that only a few of the school children met with success. In some cases the vegetables did not germinate; in others they were destroyed by insects, or by farm stock. Again a severe storm just at the time of ripening caused a lot of damage. However, most of the teachers state that the experience of the past year will help to better things this year, as more pupils will make the attempt.

MACDONALD COLLEGE

BY T. G. BUNTING, B.S.A., PROFESSOR OF HORTICULTURE

S EED of tomatoes, melons, peas and beans has been successfully raised by the Horticultural Department of Macdonald College for a number of years. This seed has been used for seed distribution in the province and for college plantings, while the surplus has been sold to the trade.

In 1914 some of the biennial vegetables were selected and stored for seed production, these consisted of onions, cabbage, beets, carrots and parsnips, from which seed has already been harvested and cleaned, in addition to seed of tomatoes, melons, corn, peas and beans. This seed will be used, as in the past, for seed dis-

tribution through the college demonstrators and for college planting, and the surplus will be sold.

Seed of some of the annual crops such as tomatoes, melons, corn, peas and beans are comparatively easy to harvest and present no serious difficulties in the way of seed production. Seed of the biennial crops have not been so generally raised in this country in the past, and consequently there is little reliable data in regard to their harvesting and marketing under our conditions.

Experience in seed production along the lines of storing roots, care during the growing season, cross pollination, climatic requirements, harvesting, cleaning and storing the seed, its freedom from disease, its viability and trueness to type in the resultant crop, and the cost of production, are questions that confront the beginner, and it is this information and practical experience that is required in order to build up a seed industry in this country. If Canadian grown seeds are no better than European

or Californian seeds and cannot be produced as cheaply, there would be little chance of the industry becoming a permanent one, whereas if the Canadian grown seeds are superior in some important respects, even if more costly, a valuable industry would undoubtedly develop.

Seed growing in Canada for most vegetable seed is only in the experimental stage and needs a few more years to determine just how successful it is likely to become. At the present time trade in seeds, as in many other lines, is considerably disorganized, but on the conclusion of peace no doubt many readjustments in the trade will take place.

The Horticultural Department of Macdonald College has already produced seed of a number of crops, which seed has proved satisfactory in the resultant crop and other crops, particularly the biennial ones, have been raised during the past season and will be continued in the future and as much information secured as possible.

MANITOBA

GROWING VEGETABLE SEEDS

BY F. W. BRODRICK. B.S.A., PROFESSOR OF HORTICULTURE AND FORESTRY, MANITOBA AGRICULTURAL COLLEGE

THE production of vegetable seeds in Manitoba up to the present time has not been taken up in a commercial way. Small quantities of some classes of these seeds may have been grown in a small way, but the quantities have been limited, and little importance can be attached to their production commercially.

One or two growers have taken up the production of high class strains of seed of garden peas. This seed which has proven to be a profitable strain for Manitoba conditions has met with a ready sale and provides profitable returns for the grower.

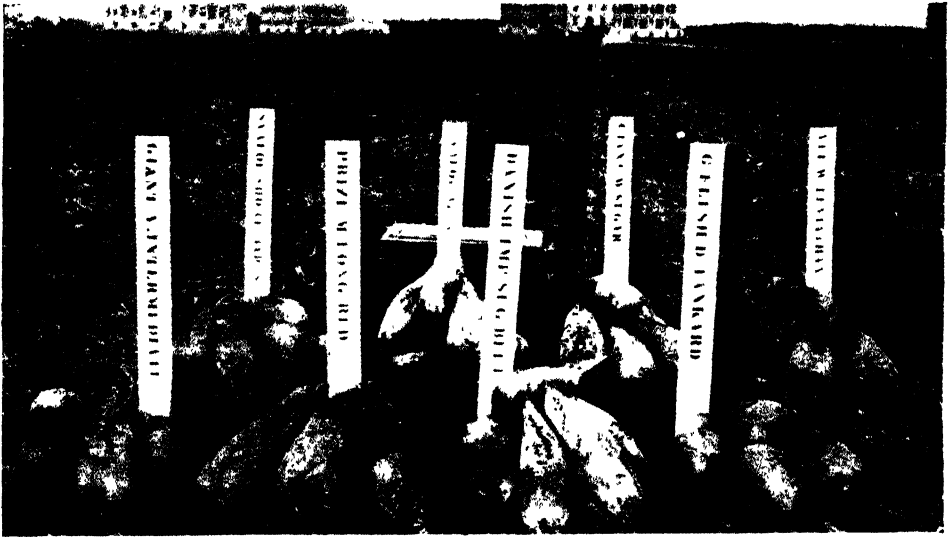
The growing of productive strains

of seed potatoes is a line that has been carried on to some extent by Manitoba growers, and the commercial advantages are clearly obvious. No class of farm crop is influenced to a greater extent by the quality of the seed than the potato, and the successful producer provides himself with a supply of carefully selected home-grown stock. The range of varieties which can be grown in this country is fairly large and the possibilities of developing the production of seed potatoes as a commercial undertaking are good.

Looking at the question of the commercial production of other classes of garden seeds such as garden roots,

cabbage, cauliflower and even some of the flowers, one might say that the opportunities offered are promising. Manitoba is a province which presents many advantages from the standpoint of vegetable production, and vegetable growing is an industry which is carried on to a considerable

tion, however, presents some disadvantages and a serious drawback in the production of vegetable seeds would be the high cost of labour. The present situation which has resulted in the cutting off of practically the entire European supply should, however, react as a stimulus



GOOD VARIETIES GROWN ON THE MANITOBA AGRICULTURAL COLLEGE FARM

extent in the province. The production, then, of supplies of high-class home-grown vegetable seeds is likely to become a profitable undertaking, as there would undoubtedly be a large local demand.

Every line of agricultural produc-

tion, however, presents some disadvantages and a serious drawback in the production of vegetable seeds would be the high cost of labour.

The selection of good seed stock; selection of all strains for vigour and quality; and careful methods of handling the crop should result in the development of a profitable industry within the bounds of Manitoba.

PRODUCTION OF FIELD ROOT SEED

BY PROF. F. J. HARRISON, B.S.A., FIELD HUSBANDRY DEPT., MANITOBA AGRICULTURAL COLLEGE

FIELD roots, turnips, man-gels, sugar beets and carrots ---are not extensively grown in the province of Manitoba, and, consequently, the seed shortage due to the war will not cause any great inconvenience at present to the average farmer here. However, with the introduction of mixed farming and the increase of live stock, more roots

will be grown and the seed supply will become more important.

With this in mind the Field Husbandry Department of the Agricultural College undertook to determine, first, if root seed could be produced profitably in Manitoba; second, if home grown seed was superior or equal to imported seed; and, third, if the yield and quality could be im-

proved by making selections of the best plants that were grown under local soil and climate conditions.

On account of this work being inaugurated only this year, no definite results have yet been obtained. In an endeavour to make the experiment more comprehensive, and at the same time interest the young farmers of

the province in this line of work, a number of the farm boys will be asked to produce seed next year. Through the courtesy of the Extension service of the Agricultural college these boys will be reached through the medium of the Boys' and Girls' clubs.

SWEET CLOVER

NOVA SCOTIA

BY JOHN M. TRUEMAN, B.S.A., PROFESSOR OF AGRICULTURE, TRURO

A SMALL area of land was seeded to sweet clover during the summer of 1914. It received the same careful treatment that we bestowed upon the adjoining plot of alfalfa. The alfalfa came on and grew luxuriantly but the sweet clover was very slow in starting and showed up very poorly alongside of the alfalfa. The

next spring 1915, the alfalfa started strongly again but the sweet clover did not do much. It had rooted well, however, and came on later in the summer and furnished us a small cutting. In this particular trial, however, it showed up very poorly beside red clover and alfalfa, not yielding more than half as much the past summer as the other two crops.

QUEBEC

BY I. J. A. MARSAN, PROFESSOR OF AGRICULTURE, OKA AGRICULTURAL INSTITUTE

NO conclusive experiments on the growing or the use of sweet clover as a fodder plant, as a fertilizer or as a honey plant, have been made at this station. Only a small plot of it has been sown, with the object of studying the botanical structure of the plant and its requirements. Sweet clover is certainly not as good in any respect, as red clover or alfalfa, except perhaps, as a honey

plant, but, I have always recommended its use for pasturing purposes in poor sandy-loams or clay-loams, where it grows better than any other leguminous crop and improves the soil by leaving humus and nitrogen. Excellent results were obtained from the growing of this plant on such soils by a number of farmers in the county of St. Hyacinthe.

ONTARIO

BY C. A. ZAVITZ, PROFESSOR OF FIELD HUSBANDRY, AGRICULTURAL COLLEGE, GUELPH

EXPERIMENTS with sweet clover at the Ontario Agricultural College extend over a period of nearly twenty-five years.

The crop was grown for hay production in comparison with Common Red, Mammoth Red, and Alsike clovers in the years 1892, 1895,

1897 and 1899, and sweet clover was compared with eight varieties of clover, sainfoin and alfalfa, from the standpoint of pasture production, in the years 1902 and 1904. Various tests were made also in cutting the sweet clover at different stages of growth for feeding to different classes of farm animals, but in all instances the animals refused to eat the crop although in some cases it was cut when quite young and tender. The bitter flavour of the crop seemed distasteful to the animals and apparently they were not starved long enough to force them to develop the acquired taste. *If the crop is to be used for hay production it seems essential to cut it before any bloom appears.* At this stage of development the growth is not as abundant, but the plants are less woody, and the leaves are more easily saved than when the crop is cut at a later period. There seems to be rather more difficulty in curing hay from sweet clover than from red clover or from alfalfa.

In each of two years an experiment was conducted at the College in comparing the amount of pasture crop produced by sweet clover and by common red clover. The yields per acre were determined at each of six cuttings in each of the two years. Three weeks were allowed between each two cuttings. The results are very interesting in furnishing definite information regarding these two crops in the production of green clover which would correspond pretty closely to the relative amounts of pasture produced. The accompanying table gives the average of the two years' experiments in tons per acre of pasture crop:

SWEET CLOVER COMPARED WITH RED CLOVER

Periods of Cutting	Sweet Clover	Common Red Clover
First cutting.....	11.0	13.5
Second cutting...	1.5	1.4
Third cutting....	2.5	2.9
Fourth cutting...	3.0	4.6
Fifth cutting.....	1.9	2.0
Sixth cutting.....	.9	1.6

The results show that, with one exception, in the average of the two years the common red surpasses the sweet clover in yield of pasture crop per acre at each of the cuttings. *In the total amount of pasture per acre per annum the common red clover surpassed the sweet clover by fully five tons or by about 25 per cent.* In comparing the sweet clover and the Alsike clover in a similar way the former was surpassed by the latter in annual yield of pasture crop per acre by a total of one and one-half tons, or by about 7 per cent.

In each of two years efforts were made to compare different crops for the production of green manure on sandy lands of the Forestry Nursery at St. Williams, Norfolk county, Ontario. In each of the years sweet clover gave comparatively poor results. This might have been due to a lack of sufficient lime in the soil.

THE TRUTH BEING PROVEN

Interesting experiments are in progress at the Ontario Agricultural College at the present time. In one section of the trial grounds an acre is devoted to a careful examination of sweet clover of seven different species, the seed of which was obtained from five countries, in Europe, Asia and Africa, from nine States of the American Union, from four localities in Ontario, and from three Ontario seedsmen. There is a marked variation in the plants growing from the seed obtained from different sources and selections. The most of the strains produce coarse stems with small scattering leaves, but the plants grown from seed obtained from Spain, and from Tompkins county, New York State, have a decidedly prominent leaf development and appear to be quite superior to the ordinary strains of sweet clover. We expect to continue the selection work in the hope of obtaining a more desirable type of plant and possibly one which will be more appetizing to farm animals

than the ordinary wild sweet clover, and will have fewer of the other objectionable features as well.

We have successfully crossed the sweet clover with the Black Medick, and are this year endeavouring to produce a cross between this hybrid and alfalfa. The object in this work is to secure a plant combining the good qualities of both the sweet clover and the alfalfa.

Sweet clover has certain good qualities which have long been recognized. Its objectionable features, however, have prevented its becom-

ing grown extensively as a farm crop. A few growers in Ontario are now booming the common wild sweet clover of the roadside, and are making money themselves by selling seed at good prices to other farmers. The good judgment of the average Ontario farmer may be depended upon in estimating pretty accurately the value of the statements of those who utterly condemn or of those who extravagantly praise the common white sweet clover as a farm crop.

From Canadian Countryman

SWEET CLOVER AS A HONEY PLANT

BY MORLEY PETTIT, PROVINCIAL APIARIST

I find there is a great variety of opinion amongst beekeepers as to the value of sweet clover as a honey plant. I am inclined to conclude that this depends a great deal on soil and climatic conditions. I do not believe that the quality is ever quite equal to that of white clover honey, and in a great many cases the quantity yielded is not sufficient to be of any great importance. For example, one rather careful observer at Chatham, in Kent county, states that he would rather there were not any sweet clover in his neighbourhood, although it is present in large quantities. He states that the honey

is of inferior quality, there is not enough of it to be stored in commercial quantities, and coming in small quantities from day to day as it does, it stimulates the bees to activity and brood rearing at a time when they should be settling down and clustering quietly for the winter.

Some beekeepers in Welland County on the other hand, report individual colonies storing as much as 80 lb. of honey from sweet clover in a season. I am satisfied that beekeepers are not nearly as much interested in the growing of sweet clover as they generally are supposed to be.

SASKATCHEWAN

BY JOHN BRACKEN, B.S.A., PROFESSOR OF FIELD HUSBANDRY

THE so-called sweet clover (*Melilotus Alba*) is a tall growing biennial plant, having coarse branching stems which bear white blossoms, and except when young, carry relatively few leaves. It is a "legume" but not a real clover. Nevertheless it has the power in common with clover, alfalfa, and other legumes, when inoculated with

suitable bacteria, to gather nitrogen from the air.

During recent months, extravagant claims, and, from different sources, quite disparaging statements have been made concerning the value of sweet clover for forage purposes. The contrary views expressed have created in the public mind a state of confusion regarding its real worth as a

cultivated crop. In order to throw more light on the subject, we have been asked to summarize the results of our experience with this crop under western prairie conditions.

We have grown sweet clover here three different seasons. In 1912 broad-casted sweet clover sown in June of the previous year was partly killed out but the remaining plants grew as high as a man. In 1913 we had no sweet clover, but in 1914 when sown in rows 40 inches apart, at the rate of 4 pounds per acre, it yielded nearly thirteen tons, green weight, per acre or considerably more than corn sown in rows the same distance apart. Last year (1915) it produced about the same yield, which was also heavier than the average yield of corn, and much heavier than the yield of any of the hay crops we had under observation.

UNDESIRABLE QUALITIES

Sweet clover has several very undesirable qualities. It is bitter, coarse, hard to cure, apt to become an impurity in alfalfa seed, and in waste places may become a weed.

Concerning its bitterness, it has been our experience that cattle, hogs and sheep will pasture it quite satisfactorily when it is young, but they do not like it when mature, nor can it be made into hay that is palatable after the blossoming stage. Most animals dislike the plant even in the young green condition at first, but they generally get to like it if kept from other feed for a short time. This experience is borne out by many practical farmers.

On account of its coarseness we have not been able to use sweet clover hay cut after the blossoming stage. It would seem that the crop must be either pastured while young or cut for hay before blossoms develop.

The same difficulties experienced in curing alfalfa are to be met with in handling sweet clover. It carries a large percentage of moisture which

makes it difficult to cure, and in addition the leaves fall off readily after drying. On account of these difficulties it would seem that at present the best use can be made of this crop by pasturing it. It is quite possible, however, that it may be found useful as a silage crop, but at present no data is available concerning its value as silage.

The seed resembles alfalfa so closely that if once mixed the two crops cannot be satisfactorily separated. For this reason the use of sweet clover in possible alfalfa seed growing centres should not be encouraged until its value has been more positively determined.

In waste places where the land is not ploughed every year sweet clover is sure to persist. It is our opinion that *Melilotus Alba*, the crop under discussion, will not become a weed on land that is ploughed every year. The fact that it is a biennial, which does not seed the year it is sown, is sufficient guarantee that it cannot become a weed on land that is ploughed every year. Under these conditions it cannot reproduce itself.

In this connection it should be pointed out that the yellow-flowered sweet clover (*Melilotus Officialis*) is much more likely to become a weed than the white-flowered species (*Melilotus Alba*). The former should not be used for any purpose.

GOOD QUALITIES

Among the redeeming qualities of sweet clover are, first, its suitability to the climate; second its productivity; third, its biennial character; fourth, it is a legume, and, fifth, it may be grown as an intertilled crop.

Sweet clover grows nearly a month before corn is up and generally remains green for a month after corn freezes in the fall. It is seldom seriously injured by spring or fall frosts. It is a crop peculiarly suited to the short growing season and the severe temperature of Western Canada.

At Saskatoon, sweet clover when

sown in rows has yielded more than any other forage crop, and rather more than corn during each of the last two seasons. It is rich in nitrogenous compounds, but, unless cut in the early stages of growth, is neither as palatable nor as digestible as most of our other crops.

The chief fault of all perennial crops, including alfalfa, Western Rye grass, Brome grass and timothy, in a dry climate, is that they give no favourable opportunity for storing a surplus of moisture after the year they are sown. As a result no perennial crop yields large annual returns under dry conditions after the first crop. The biennial character of sweet clover is therefore much in its favour. It has been observed also that sweet clover land is much more easily ploughed than alfalfa land, for the reason that after the second season the sweet clover roots are dead and partially decayed and do not therefore increase the draft in ploughing, while it is common knowledge that alfalfa fields are ploughed only with great difficulty.

Sweet clover is a nitrogen gatherer. In this respect it is not different from the commonly grown clovers and alfalfa. It is an interesting fact that the bacteria that produces the nodules on sweet clover is the same species as that which is used to inoculate alfalfa. The roots of a sweet clover crop, which was inoculated with alfalfa bacteria, were found in our experiments here to be carrying dense masses of nodules.

When sown in rows two and a half or three feet apart and cultivated the crop yields more than when sown in close rows with more seed, and it is our opinion that the following crop will be much greater where wide rows are used than where the seed is sown in the ordinary manner. It should be pointed out in this connection that a much finer quality of hay may be secured from the thick seeding than from the use of wide rows. It would seem that unless

the crop is used altogether for pasture, or possibly for silage, that the coarseness due to thin seeding will be such a disadvantage that this practice will not be found satisfactory.

It has been claimed that sweet clover is resistant to alkali in soils, and considerable evidence has been advanced supporting this contention. It has been observed, however, at several places in Saskatchewan last year that it did not prove satisfactory on certain of our alkaline soils. It is possible that the crop is somewhat resistant to alkali and there is no question but that it will not grow under badly alkaline conditions.

THE CULTURE OF SWEET CLOVER

Like most other crops sweet clover will do best if sown on fallow land. On account of its biennial nature, however, this preparation is generally too costly. Quite satisfactory stands can be secured from sowing on well worked fall or spring ploughing that is free from grass. The surface soil should be quite firm and the seeding should be done in the rainy time—generally in the month of June.

If sown in rows 24 to 36 inches apart, 3 to 6 pounds per acre is sufficient. When sown broad-cast or in 6 inch rows, 8 to 12 pounds or more should be used.

In most seasons the crop will grow from 1 to 2 feet high the first year. This may be either pastured off or cut for hay as desired. The following year the first crop is generally ready to cut the latter part of June, and the second crop the latter part of July.

The crop needs to be well cured in the swath, windrow or cock before being stored in either stack or barn. If the crop is used for pasture only, the tall growing stems that get ahead of the stock should be clipped back occasionally with a mower to prevent seeding and to encourage the development of fresh shoots.

In case it is desired to grow the crop for seed it should not be cut for hay early in the season. Yields of from 6 to 12 bushels of seed have been reported. For this purpose rows 2 to 2½ feet apart would seem to give best results.

EXPERIMENTS UNDERWAY AT SASKATOON

At the present time we have under observation, eight different species of sweet clover. Two of these we are growing in rows, different distances apart, and are also planting them at different rates per acre, and at different times in the season. We propose to test *Melilotus Alba* for both hay and pasture purposes, and will also test out its value as a silage crop.

GENERAL CONCLUSIONS

At present the probable usefulness of sweet clover in western agriculture seems to lie in its value as, first, a two-season pasture crop; second, a possible hay crop if cut early; third, a possible silage crop, which either alone or mixed with Winter Rye or corn *may* be found of value. If use can be made of the coarser growth from wide rows intertilled, this me-

thod of growing will probably be found the best under semi-arid conditions. It will at the same time produce some of the desirable effects of an intertilled crop.

It should not be forgotten, however, (1) that sweet clover is bitter, particularly in the later stage of its development; (2) that it is coarse in texture and therefore unpalatable, and in the mature condition relatively indigestible; (3) that it is hard to cure on account of its large moisture content; (4) that it may become an undesirable plant in alfalfa seed growing centres, and (5) that much more information must be obtained concerning it before it can be rejected as being worthless, or as being more harmful than beneficial, or accepted as a forage crop suitable for general use.

Sweet clover has many good qualities and some very bad ones. If the latter can be overcome the crop will have an important place in our agriculture. If they cannot be overcome, it will occupy only a limited sphere of usefulness. Investigations now underway should give such added information as is necessary to determine the relative value of sweet clover among our cultivated crops.

ALBERTA

BY W. J. STEPHEN, B.A., PRINCIPAL, SCHOOL OF AGRICULTURE, CLARESHOLM

Our experimental area we have been growing both the white and yellow sweet clover. It does extremely well here. At first cattle and hogs do not care for it on account of the bitterness but after a time they get accustomed to it and eat it with apparent relish. When growing it for feed, it should be sown thickly; otherwise it will grow up very coarse and un-

palatable. We have not conducted experiments with it for honey production. It is difficult for the inexperienced farmer to distinguish it from alfalfa when growing, or from the seed, so that great precaution should be taken not to grow it near the alfalfa field. It has a tendency to spread, but to date we have had no difficulty of killing it.

NOVA SCOTIA

OPENING OF NEW SCIENCE BUILDING AT COLLEGE OF AGRICULTURE

THE new science building of the College of Agriculture at Truro was formally opened on January 11th, by Dr. C. C. James, Dominion Agricultural Commissioner. Hon. J. A. Murray, Minister of Agriculture for New Brunswick, and Hon. G. H. Murray, Premier and Commissioner of Agriculture for Nova Scotia, also delivered addresses. The proceedings commenced in the largest lecture room of the new building, but during the evening the place became so crowded that a movement was made to the large assembly hall in the main building of the College, where one thousand people were crowded in. As a two weeks' course in household science and economics under the auspices of the Women's Institute was in progress, it was intended that Miss Jennie A. Fraser, Superintendent of Women's Institutes, should occupy the chair, but as illness prevented that lady's attendance, Professor Cumming, Principal of the College, presided.

Dr. James congratulated the Province on the interest manifested in technical education, and stated that the new science building was as good as any in Canada for the purpose to which it was to be devoted. Referring to the work of the Women's Institutes he said that it was the most important work that could be undertaken. If they took advantage of the opportunities that would be offered by the new school he believed that a great blessing was in store for women in the rural parts of Nova Scotia.

A GREAT STEP FORWARD

Provincial Premier Murray after referring to the value of agricultural

education and the advancement that it was making suggested that on the subject of farming New Brunswick, Prince Edward Island and Nova Scotia were on common ground and could work together. Co-operation in this matter would result in mutual benefit and in the saving of public money. They were all interested in the stimulation of education so that the most might be made of the national resources. The science building was a great step forward and one that would commend itself to all thoughtful people. The time might not yet be ripe for the confederation of the three Maritime provinces, but co-operation in agricultural work was possible and might pave the way for other things.

The Hon. J. A. Murray, Minister of Agriculture for New Brunswick, offered the felicitations of his province to the people of Nova Scotia on the progress that agricultural education was making with them especially with regard to the introduction of a branch of technical instruction designed for women of the farm. In New Brunswick there were three agricultural schools, but it was desirable that one strong agricultural college should be built up at Truro. The three Maritime Provinces had nothing greater in common than agriculture.

AN INTER-PROVINCIAL CONFERENCE

On the day following the inaugural of the science building, or on January 12th, the inter-provincial conference on agriculture and educational matters called for by Premier Murray of Nova Scotia was held, those participating being Premier Murray,

who is also Commissioner of Agriculture, Principal Cumming, Professor L. A. DeWolfe, Director of Agricultural Education, representing Nova Scotia; Hon. J. A. Murray, Minister of Agriculture, J. B. Daggett, Secretary for Agriculture, Dr. W. S. Carter, Superintendent of Education, R. W. Steeves, M.A., Director of Elementary Agricultural Education, representing New Brunswick; Professor W. R. Reek, Director of Agricultural Instruction, representing Prince Edward Island; and W. W. Hubbard, Superintendent of the Experimental Farm, Fredericton, N.B., and Dr. C. C. James, Agricultural Commissioner, on behalf of Canada. Hon. Murdock McKinnon, Commissioner of Agriculture for Prince Edward Island, was held up on the way to Truro by a storm blockade.

The following subjects were discussed at the Conference:—

1. Commercial Fertilizers in the Maritime Provinces for 1916—supplies, costs and transportation.
2. Organization to further the potato industry.
3. Tile Drainage: how to reduce cost of materials, establishment of plants, freights, etc.
4. Agricultural instruction in public schools, and in the new schools in New Brunswick.
5. Co-operation of the three provinces in the Maritime Agricultural College at Truro.

SHORT COURSES IN DOMESTIC SCIENCE

Fifty young women from different parts of Nova Scotia were enrolled as students in the course of instruction in household arts promoted by the forty-four Women's Institutes of the province, every county except one being represented. Miss Annie Redmond, of Dartmouth, was instructor in Domestic Science; W. A. McKay, Dairy Superintendent, in Dairying;

Professor Shaw, Provincial Horticulturist, and Professor James Allan, in Horticulture; Mrs. Hopkins, of the Technical College, Halifax, in Dressmaking, and J. P. Landry, Provincial Poultry Superintendent, in Poultry raising.

WOMEN'S PATRIOTIC WORK

In addition to this course, eighty representatives of the Women's Institute gathered in convention. The report of the Superintendent showed an active membership of 400 and that a vast deal of patriotic work had been done during the past year. To the Red Cross Fund \$8,000 had been contributed in cash and for Belgian relief, \$700. To the Canadian Red Cross a motor ambulance had also been presented at a cost of \$1,500, and 162 boxes of Red Cross supplies had been shipped across the Atlantic. While performing this good work the ladies have not neglected the call for improvement in local conditions. They have paid especial attention to educational matters and in cases have erected assembly halls. In the new science building, under the superintendency of Miss Fraser, a graduate of Macdonald College, Quebec, the supervision of Principal Cumming, and the assistance of a staff of capable instructors, it is proposed to prosecute study in household science with all the vigour and earnestness possible.

NEEDS OF THE EMPIRE

In the afternoon of January 12th Dr. James addressed those in attendance at the Convention and at the two weeks' course, on the needs of the Empire at this juncture. He urged that it was the duty of the farming community, men and women alike, to do all they could in meeting the requirements of Great Britain and her allies. He likened the agricultural short course, then being held, to a council of war from which all in attendance would go home equipped to plan their work so as to

produce along the most desirable lines and to make their labour more efficient. The call of "Patriotism and Production" is more significant in 1916 than it was in 1915.

This Conference was so instructive

and so much appreciated that there is a probability of its becoming a regular event, meeting once a year in each of the three provinces, having its attendance increased and its scope enlarged.

QUEBEC

THE PROGRESS OF AGRICULTURE

BY H. NAGANT, EDITOR LE JOURNAL D'AGRICULTURE

THE province of Quebec distinguishes itself among the agricultural provinces of the Dominion not only by the value of its field crops which is now over \$115,000,000 yearly, and by the variety of its products, but also by the rapidity of its progress in agricultural industries. The production of milk may be given as an instance: in 1900 the quantity of milk produced was valued at \$21,000,000; in 1910 the total value of milk production was \$31,000,000, an increase of \$10,000,000 in ten years, or at the rate of \$1,000,000 a year.

THE DAIRY INDUSTRY

For the last few years our dairy industry has made giant strides; the methods of manufacture have been improved to such an extent in our 2,200 butter and cheese factories that it now occupies first place in Canada (for butter at least), as shown by the prizes which it has won several years in succession at the great exhibitions at Toronto and Ottawa.

It has been truly said that the province of Quebec is the country of milk, sugar and honey. Of milk, owing to the abundance of its fodder production; of sugar, owing to its national industry of maple sugar and syrup, products for which there has been an active demand this year in France and England, and of honey, by the variety and aroma of its honey plants; by full carloads this year the

honey of the province was shipped to Ontario and the West.

THE LIVE STOCK INDUSTRY

The progress made in the breeding of pure bred animals is also worthy of mention. This work is now being carried on on a national basis. Dr. J. A. Couture, Secretary of the Quebec General Breeders' Association, has said in this connection: "There are now as many breeders of pure bred sheep in the province of Quebec as in all the other provinces of Canada combined. The number of sheep registered from Quebec has been as great as that of all other provinces combined, not including Ontario. The number of transfers, that is of sales of sheep, has been as large as for Ontario. As for the breeding of pigs, Quebec now comes second for the number of pure bred pigs. It is also to be remembered that Quebec takes first place in the breeding of Ayrshire cattle and second for Holstein cattle."

GRAIN PRODUCTION IN 1915

In the year 1915 which has truly been called "The Year of Agricultural Development," the farmers of the province, following the advice dictated by the necessity of the times, endeavoured to increase the area seeded in grain and to increase the yield by a better preparation of the soil and by the use of better seed grain.

According to information given by Mr. Marquis, Chief of the Bureau of Statistics, Quebec, the area seeded for the whole of the province was fifteen to twenty per cent greater than the previous year.

In the county of Brome, the increase in the seeded area has been as large as sixty-eight per cent, owing to the encouragement given the farmers in the shape of premiums by a number of rich farmers of the county. In the counties of Beauce, Dorchester and Mégantic, the wheat-seeded area has been at least seventy-five per cent larger than in previous years. In the northern district, comprising Chicoutimi and Lake St. John

counties, it is stated that the area sown in cereals in older parishes has been twenty per cent greater than in previous years.

Wheat growing, which, in previous years, appeared to be decreasing, has come to the fore again. Some 1,500,000 bushels were produced in 1915, which is 500,000 bushels more than in 1914, an increase of fifty per cent.

The yield of oats is about 44,000,000 bushels, about 2,000,000 bushels more than in 1914. The other grain crops (rye, barley, peas, beans, buckwheat, etc.,) although not showing such large increase, were all better than in 1914.

TEACHING POULTRY BREEDING

BY BROTHER M. LIGUORI, LECTURER ON POULTRY, OKA AGRICULTURAL INSTITUTE

DURING the fiscal year 1914-15 there were 75 institutions in the province where poultry breeding was taught by means of lectures or practical demonstrations. These institutions were the following:--

- 30 breeding and fattening poultry stations.
- 40 normal or domestic science schools, where the practical teaching of poultry breeding is organized.
- 5 co-operative incubation stations.

STATIONS

Only a small number of these establishments belong to the government, but when the government does not own the building it rents the grounds and the buildings used for the keeping of poultry and the growing of feed for such. This is the case for the majority of poultry and breeding stations. The cost of annual rent for the ground, the buildings, the implements and flocks, under the supervision of the Department of Agriculture equals about 10 per cent of the total value. The rent must not exceed \$100. The building is managed by a competent inspector who is generally in charge of

two or three stations. When he is away, his place is taken by the proprietor, who receives the visitors, answers their questions, keeps the books, and makes daily records for the monthly reports that are sent regularly to the Department. Therefore the proprietor acts as assistant manager, but always in accordance with the instructions received. The proprietor receives a small salary for this work. To make a profit, he must rely, not on the few dollars that are paid to him by the Department of Agriculture, but also on the profits from his poultry work. With this system he is encouraged to do his work carefully and to increase the scope of his operations.

All these establishments must breed poultry by natural and artificial means. Artificial means are the most generally used. From 300 to 1,500 chicks, the majority of which belong to the American breeds, are reared at these stations. For the last two years most of these stations have been furnished with incubators and brooders made in the province of Quebec.

INSTRUCTORS AND DEMONSTRATORS

Practical demonstrations on the candling of eggs, the castration of roosters, slaughtering, plucking and packing for the market, are made by the instructors at their respective stations. The public, and particularly the school children of the district, are invited to these demonstrations. The instructors also look after the poultry interests in their respective districts. They help in organizing co-operative institutions, distribute eggs to the school children and supervise the work of the latter. In the future these instructors will be required to have a sufficient knowledge of gardening and fruit culture, and particularly of the growing of food plants for the poultry.

DOMESTIC AND NORMAL SCHOOLS

The work in these schools is the same as in the stations. The pupils are also taught by lectures and practical demonstrations.

CO-OPERATIVE INCUBATORS

Co-operative incubators are incubators with a number of sections or drawers. Farmers take their eggs to this machine just as they take their milk to the cheese factory. Three weeks later they return for their chicks, which are one day old. No chicks are bred at these buildings, they are just hatched. An instructor is in charge of these incubators, which are generally heated by means of coal. A charge of two cents per egg is made to the persons who bring their eggs to the incubator. These machines, which have so far given good satisfaction, are to be found at the Provincial Dairy School of St. Hyacinthe, the cured meat factory of the Agricultural Co-operative Association of St. Valier, county of Bellechasse, the Poultry College of St. Thomas d'Aquin, near St. Hyacinthe and other establishments.

CO-OPERATIVE ASSOCIATIONS

Several co-operative associations ship their eggs co-operatively. The majority of these eggs are sent to the co-operative society of cheese makers of the province of Quebec, who also handle fat poultry.

NATURAL INCUBATION AND REARING

For the last two years an agricultural extension society, "The Quebec Farmers' Experimental Union," has had tried by its members a brooder-incubator by natural means, which may be manufactured on the farm. There is nothing mysterious about this invention--if it is an invention. It merely consists of a shelter 10 feet long, 5 feet wide and 4 feet high or thereabouts. Eight hens sit at the same time and rear their chicks after they are hatched. The main advantage of the system is that it requires much less watching, thus saving much time. This subject will be dealt with at a greater length as soon as the "Quebec Farmers' Experimental Union" has reported on it. At present it will be sufficient to say that the majority of the reports received have been satisfactory.

LITERATURE

Besides Bulletin No. 4, prepared by the poultry manager of the Oka Agricultural Institute, the Department has distributed a number of circulars prepared by the provincial poultry division and dealing with the preparation and sale of eggs, incubation, fattening, etc.

FOR SCHOOL CHILDREN

Over a thousand of settings of eggs were distributed, during the year, by district representatives, instructors and superintendent of stations, in their respective district. A similar distribution has been made by the College of Agriculture which has kept a close watch over the work of the school children.

SCHOOL FAIRS IN THE DISTRICT OF BEDFORD

BY EMILE A. LODS, B.S.A., MACDONALD COLLEGE DEMONSTRATOR

THE School Fair movement in the district of Bedford has so far been unquestionably successful. Keen interest was shown throughout the season by both the pupils and the parents. Corn, oats, potatoes, swedes, flowers, and weed collections were shown. Particular mention of the Quebec No. 28 corn shown at Bedford should be made. There were several entries of remarkably good and uniform material shown, a fact that made the class difficult to judge. The judge found

that this was the best exhibit of corn that he had seen at any exhibition in Eastern Canada. The seed and eggs for this work were furnished by Macdonald College and the work is in charge of the Macdonald College demonstrator at Cowansville. The demonstrator wishes to acknowledge the value of the co-operation of the teachers and the parents in making this work successful.

NOTE:—Other school fairs in Quebec were described in the January number of **THE GAZETTE**.

ONTARIO**ACRE PROFIT COMPETITIONS IN 1915**

BY C. F. BAILEY, B.S.A., ASSISTANT DEPUTY MINISTER OF AGRICULTURE

THE Ontario Department of Agriculture, through its district representatives, conducted 59 acre profit competitions during 1915. These were open to young men who have taken the four to six weeks' course conducted by the district representatives, and the prize was the short course in live stock and seed judging at the Ontario Agricultural College, Guelph, January 11th to 22nd, transportation to Guelph and return and board and lodging while there. Sixty-seven young men took the short course at Guelph last month at the expense of the Department, as winners in these competitions. Where eight or more contestants finished in a competition, two men were sent to Guelph.

At the conclusion of the short course an examination was held

for the winners in all the competitions to decide the best all-round man in stock and seed judging, and a gold watch was awarded to the young man obtaining the highest marks. This was donated by the Deputy Minister of Agriculture and the Assistant Deputy Minister.

In estimating the cost of operation, \$5 per acre was allowed for the rent of the land, 15 cents an hour for manual, and 10 cents an hour for horse labour. The values used in figuring profit are given in the list below. The results are very much above the average yield of the province and are another evidence of the possibilities of intelligent agriculture. The following is a list of the winners, giving some very interesting figures as to the cost of production and profits in various crops:—

POTATOES.

(MARKETABLE, 75C. PER BUS.; UNMARKETABLE, 37½C. PER BUS.)

COUNTY	WINNER	Yield	Cost of Production	Profit
MUSKOKA	Milton H. Goltz, Bardsville Clay loam, following oats, farmed 10 years, 5 loads manure, Paris green; Davies Warrior.	514 bus.	\$42 02	\$336 72
RENFREW	Percy Wright, R. R. 2, Westmeath. Loam, following barley, farmed 60 years, 12 loads manure, Paris green and Bordeaux; Green Mountain.	421 bus. 30 lb.	42.09	269 81
PARRY SOUND	C. W. Campbell, Powassan Clay loam, following peas, farmed 20 years, 4 loads manure, Paris green; Early Rose and Comet.	405 bus.	39 30	253.20
PORT ARTHUR	Edwin Payton, Dorion Station Sandy loam, following timothy, farmed 8 years, 19 loads manure; Carmen No. 1.	402 bus.	49 55	245 20
LAMBTON	H. V. Kember, R. R. 1, Sarnia Rich sandy loam, following potatoes, farmed 50 years, 15 loads manure; Irish Cobbler.	394 bus. 30 lb.	40 29	240 67
GRENVILLE	J. Gordon Davidson, R. R. 1, Kemptville Clay, following corn, farmed 50 years, 12 loads manure, Bordeaux and Paris green and arsenate of lead; White Star.	401 bus. 30 lb.	47 90	237 85
GREY	R. S. Mundle, R. R. 3, Owen Sound Clay loam, following oats, farmed 52 years, 12 loads manure, Paris green, bluestone and lime; Vulcan.	363 bus.	53 15	196 22
RAINY RIVER	Harry McCool, Burriess Rich clay, following oats, farmed 2 years, Bordeaux and Paris Green; Delaware.	313 bus.	41 05	186 20
SUDBURY	Frank McDonald, Warren Clay loam, following oats, farmed 15 years, 6 loads manure, Paris green; Rapid Transit.	330 bus. 30 lb.	44 86	176 39
KENORA	Wm. Alcock, Kenora Sandy loam, following potatoes, farmed 10 years, 8 loads manure, 300 lbs. land plaster; Delaware.	294 bus. 30 lb.	42 25	170 93
PETERBOROUGH.	John Young, Ennismore Sandy loam, following clover, farmed 35 years, Paris green, variety unknown.	256 bus. 12 lb.	39 95	148 37
PRINCE EDWARD.	Joseph Jackson, Picton Clay loam, following oats, farmed 95 years, 9 loads manure, 700 lbs. 2-8-10 arsenate of lead, Carmen No. 1.	225 bus.	48 78	115 84
DUFFERIN	W. T. Dean, Shelburne Sandy loam, following potatoes, farmed 30 years, 12 loads manure, Paris green and Bordeaux; Comet.	161 bus. 2 lb.	34 59	84 37
DURHAM	Irwin R. Bragg, R. R. 4, Bowmanville Loam, following oats, farmed 75 years, 10 loads manure, Bordeaux mixture; Eureka and Empire State.	130 bus.	44 60	71 65
WELAND	Carl Woolnough, R. R. 1, Niagara Falls Rich loam, following pasture, farmed 60 years, New Ontario Reds.	140 bus.	29 90	60 10
MIDDLESEX	Archie D. Limon, R. R. 2, Strathroy Sandy loam, following wheat, farmed 53 years, 10 loads manure, Bordeaux and arsenate of lead; Dooley.	117 bus. 20 lb.	32 86	53 14
WENTWORTH	Leslie J. Christie, R. R. 2, Ancaster Sandy loam, following clover, 10 loads manure; Delaware.	126 bus.	30 00	44 25
NORTHUMBERLAND.	Archie Ferguson, Warkworth Clay, following hay, farmed 30 years, 9 loads manure, Paris green, American Wonder.	90 bus.	31 50	30 00
FRONTENAC	Roy Ewing, Elginburg Clay loam, following oats, farmed 50 years; Churchill.	51 bus. 30 lb.	26 50	9 87

OATS

(40C. PER BUS.)

LANARK....	James J. Pennett, R. R. 2, Perth Clay loam, following potatoes, farmed 75 years; Improved Banner.	104 bus. 10 lb.	17.75	28 98
BRANT. . . .	Osborne Rosebrugh, St. George Loam, following mangels, farmed 100 years; O.A.C. 72.	92 bus. 28 lb.	16 02	21 11
FRONTENAC	Roy Ewing, Elginburg. Loam, following hay, farmed 47 years; Banner.	90 bus. 17 lb.	16.42	19 78
GLENGARRY & EAST STORMONT	Eddie McKillican, Moose Creek Loam following, corn, farmed 50 years; O.A.C No. 72.	83 bus. 2 lb.	14 02	19.20

COUNTY	WINNER	Yield	Cost of Production	Profit
WENTWORTH	Albert Whitfield, R. R. 3, Dundas Sandy loam, following mangels farmed 100 years; O.A.C. No. 72.	87 bus.	15 86	18.94
SIMCOE	J. W. Flynn, Alliston Loam, following potatoes, farmed 50 years; New White Derby.	84 bus. 4 lb.	15 11	18.54
DUNDAS & WEST STORMONT..	Ford McMillan, Finch Clay, following pasture, farmed 12 years, O.A.C. No. 72.	82 bus. 20 lb.	14 56	18 48
YORK	W. A. Baldock, Thistleton. Loam, following potatoes, farmed 8 years; O.A.C. No. 72.	84 bus.	15 65	17.95
CARLETON	Percy J. Bardley, North Gower Rich clay loam, following potatoes, farmed 50 years; O.A.C. No. 72.	82 bus. 12 lb.	15 39	17 67
MIDDLESEX	Archie Muxlow, R. R. 1, Kerwood Clay loam, following potatoes, farmed 55 years; Siberian.	85 bus. 30 lb.	16 91	17 44
PEEL	Tindale Rutherford, R. R. 2, Belton Clay following, fall wheat, farmed 75 years; O.A.C. No. 72.	81 bus. 6 lb.	15 97	16 50
HALDIMAND	A. J. Hunter, R. R. 3, Hagersville Loam, following potatoes, farmed 50 years, 4 loads manure; O.A.C. No. 72.	74 bus 9 lb.	16.71	13 00
RENFREW	Norman Jamieson, R. R. 3, Renfrew Clay loam, following corn, farmed 30 years, O.A.C. No. 72.	61 bus.	13 43	10 97
ELGIN	Elton H. Jackson, Straffordville Sandy loam, following corn, farmed 30 years; variety not known.	63 bus. 20 lb.	11 70	10 74

MANGELS
(12C. PER BUS.)

HALTON	Jos Willmott, R. R. 1, Milton Clay loam, following pasture, farmed 85 years 4 loads manure; White Sugar Beet Mangels.	1652 bus.	42 33	155 91
DURHAM	Wilfrid Elton, R. R. 1, Fraserville Clay following wheat, farmed 60 years, 18 loads manure, Sludstrup.	1352 bus.	31 85	130 39
MANITOULIN	Wm. Cooper, Mindemoya Clay, following peas, 2 loads manure; Windsor.	1278 bus. 40 lb.	31 60	121 84
BRUCE	John Hossfeld, R. R. 4, Walkerton Clay loam, following wheat, farmed 40 years, 10 loads manure; Ideal.	1135 bus.	28 88	107.32
WATERLOO	Wesley Heipe, R. R. 1, Waterloo Black loam, following wheat, farmed 50 years, Yellow Leviathan.	999 bus.	22 90	96 98

SILAGE CORN
(\$3.00 PER TON)

OXFORD	Archie R. Gregg, R. R. 1, Salford Clay loam, following pasture, farmed 60 years, 8 loads manure, 350 lbs. potash; Wisconsin No. 7.	39 tons, 1400 lb.	18 15	100 95
HALTON	J. F. Campbell, R. R. 4, Milton Loam, following pasture, 6 loads manure, 3000 lbs. ground limestone; Big Crop.	38 tons, 1000 lb	21 55	93 95
VICTORIA	George Suggitt, R. R. 1, Fenelon Falls Clay loam, following oats, farmed 20 years; Big Crop.	32 tons, 240 lb.	14 73	81 63
YORK	Robert Watson, R. R. 2, Woodbridge Clay, following oats, farmed 40 years, 10 loads manure; Improved Leeming.	32 tons	17 56	78 44
BRUCE	H. D. Thomson, Dobbinton Clay, following hay, farmed 35 years 10 loads manure; Bailey.	29 tons, 1799 lb.	16 90	72 80
GREY	Elmer Warling, Vandeleur Clay loam, following pasture, farmed 57 years; Ninety Day.	29 tons, 1360 lb.	18 75	70 29
SIMCOE	F. E. Weir, R. R. 1, Collingwood Loam, following oats, farmed 25 years, 10 loads manure; Improved Leeming.	29 tons, 720 lb.	23 43	64 65
PEEL	Eldridge Kellam, Nashville Clay, following gay, farmed 40 years; Wisconsin No. 7.	27 tons, 400 lb.	17 05	64 55
WELLAND	Lloyd Snyder, R. R. 1, Welland Clay loam, following potatoes, farmed 100 years, 5 loads manure; Bailey.	22 tons, 53 lb.	16 40	49 67
ALGOMA	James Nott, MacLennan Clay, following potatoes, farmed 12 years, 5 loads manure; Compton's Early.	21 tons, 1040 lb.	17 40	47 16
ONTARIO	Roy F. Lick, R. R. 3, Oshawa	17 tons, 60 lb.	29 77	21.32

CORN FOR SEED
(\$1.25 PER TON)

COUNTY	WINNER	Yield	Cost of Production	Profit
LAMBTON	Graham Griffith, Mandaumin Clay loam, following sugar beets, farmed 2 years; Whitecap.	154 bus.	12 32	180 18
LENNOX & ADDINGTON	John Breault, R. R. 1, Enterprise Clay loam, following timothy, farmed 35 years, 4 loads manure; Longfellow.	94 bus. 19 lb.	42 70	75 22
ESSEX	Gerald Smith, Ruthven Loam, following hay, farmed 60 years, 3 loads manure; White Cap.	72 bus.	18 24	71 76

TURNIPS
(12C. PER BUS.)

PORT WILLIAM	Roland Brown, Hymers Rich loam, following potatoes, farmed 9 years, Kangaroo Swede.	994 bus 40 lb.	21 94	97 42
TIMISKAMING.	H. A. Parker, Uno Park Clay loam, following potatoes, farmed 15 years, 10 loads manure; Canadian Gem and Magnum Bonum.	942 bus.	42 76	70 28

SPRING WHEAT
(80C. PER BUS.)

DUNDAS & WEST STORMONT.	Silas Farrell, R. R. 1, Finch Clay loam, following potatoes, farmed 40 years; Marquis.	46 bus. 45 lb.	15 18	22 22
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BARLEY
(55C. PER BUS.)

NORFOLK	C. B. Hazen, R. R. 2, Port Rowan Clay loam, following corn, farmed 75 years, 4 loads manure; O.A.C. No. 21.	51 bus.	17 28	10 77
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BEANS
(\$3.50 PER BUS.)

KENT	Clifford Smith, R. R. 3, Ridgetown Clay loam, following wheat, farmed 60 years 9 loads manure, 200 lbs. 16 per cent phosphate; Yellow Eyes.	22 bus. 20 lb.	21 55	56 61
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RULES AND REGULATIONS OF THE COM-
PETITION

1. Open to all young men who have taken the Course in Agriculture conducted by the district representative, except winners in previous Acre Profit Competitions.

2. The prize is a Two Weeks' Course in Live Stock and Seed Judging at the Agricultural College, January, 1916, railway fare to Guelph and return and two weeks' board.

3. The prize is awarded to the young men showing the largest net profit from an acre of land.

4. Accurate account is to be kept of all labour, cost of seed, fertilizer, etc. Any contestant who fails to fill out accurately the form supplied by the district representative will be disqualified.

5. There must be 6 entries before a competition can be held. Unless at least 4 complete the contest, no prize will be awarded. If 12 or more entries are secured in a Competition and at least 8 complete the contest, two men will be sent to Guelph.

6. Two competitions (different crops) may be conducted in a county provided 6 entries are secured in each.

7. The crop should be decided by a vote of the competitors.

8. The Competition will be confined to a measured acre. The district representative will inspect the field and see that it is correctly measured.

9. If possible, the district representative will be on hand when the crop is measured or weighed.

10. A uniform price will be made throughout the Province for the value of the various crops grown when estimating the net profit per acre.

11. The representative will certify to the correctness of each report. All reports must reach this Department before November 15th.

12. Where the competition is conducted in a grain crop, in order to keep the grain separate and avoid delay in forwarding reports waiting for it to be threshed, select a square rod at 3 or 4 places in the field, cut by hand, and thresh with a flail.

13. At the conclusion of the course at Guelph a competition will be held in the judging of live stock and seed, and a gold watch will be presented to the man showing greatest efficiency.

FEEDING HOGS FOR PROFIT COMPETITION

THE Ontario Department of Agriculture, through its district representatives, conducted 16 Feeding Hogs for Profit competitions during 1915. These were open to young men who have taken the four to six weeks' course conducted by the district representatives and the prize was the short course in live stock and seed judging at the Ontario Agricultural College, Guelph, January 11th to 22nd, transportation to Guelph and return and board and lodging while there. Seventeen young men took the short course at Guelph last month at the expense of the Department as winners in these competitions. Where eight or more contestants finished in a competition two men were sent to Guelph. At the conclusion of the short course an examination was held for the winners in all the competitions to decide the best all round men in stock and seed judging, and a gold watch awarded to the young man obtaining the highest marks. This was donated by the Deputy Minister of Agriculture and the Assistant Deputy Minister.

The hogs were selected when six

weeks old and a value of \$4 each was placed on them at that age. Contestants were allowed to feed four and select the best three at the end of the competition. They were fed until 22 weeks of age and a record kept of the amount of feed used each week. Feed was valued as follows:

	Per ton
Ground Oats..	\$28 00
" Barley.	28 00
" Peas	35 00
" Rye.	28 00
" Wheat.	35 00
Bran.	23 00
Low-grade Flour or Red Dog	32 00
Shorts or Middlings..	28 00
Tankage	46 00
Green Feed.	2 00
Skim Milk.	5 00
Butter Milk	6 00
Whey.	3 00
Pasture..	per hog 75

In estimating the profit, the value of the hogs, live weight, fed and watered, was taken at 9c. per pound. The prize was awarded by taking into consideration both the profit and the type, 50 per cent being allowed for each, the bacon hog score card being used for scoring type.

Following are the names of the winners:-

COUNTY	WINNER	Breed	Average Cost Production	Average Value	Average Profit
GREY	Lawson Sewell, R. R. 2, Meaford	Yorkshire, Tamworth & Berkshire cross	\$12 53	\$24 84	\$12 31
OXFORD	J. S. Pollard, R. R. 1, Mt. Elgin	Tamworth	13 63	24 84	11 21
RENFREW.	Calvin White, R. R. 2, Pembroke	Yorkshire	9 14	19 65	10 51
FRONTENAC	Owen Fitzgerald, R. R. 3, Harrowsmith	Tamworth & Berkshire	8 86	18 69	9 83
MIDDLESEX	Archie Limon, R. R. 2, Strathroy	Yorkshire	9 33	18 72	9 39
CARLETON	Willis McRostie, Vernon	Yorkshire	7 94	16 53	8 59
VICTORIA	Victor Knox, R. R., Fenelon Falls..	Yorkshire & Tamworth	10 97	19 83	8 86
RAINY RIVER.	Hugh J. Hunter, Sleeman	Yorkshire	11.49	19 86	8 37
MANITOULIN	Harold Lane, Barrie Island	Yorkshire	9 95	18 27	8.32
ELGIN	F. E. Leeson, Aylmer.	Tamworth & Berkshire cross	8 60	16 86	8 26
NORFOLK	C. Bing Hazen, Port Rowan.	Chester White	8.77	16 41	7 64
WATERLOO .	Oscar Schierholtz, R. R. 2, Elmira	Yorkshire & Berkshire cross	9 30	15 90	6 60
DURHAM. .	Laurie B. Cole, R. R. 4, Bowmanville .	Yorkshire & Berkshire	9 00	15 39	6 39
DUNDAS & WEST STORMONT.	Clayton Froats, Finch. .	Yorkshire	11.24	17 55	6 31
HALDIMAND .	Thomas Laidlaw, Hagersville.	Yorkshire & Chester White	13 46	19.45	5.99
BRANT.....	Wm. Brooks, R. R. 3, Paris . .	Tamworth & Berkshire cross	9.55	14.73	5 18

RULES AND REGULATIONS

1. Open to all young men who have taken the course in Agriculture conducted by the district representative, except winners in previous Feeding Hogs for Profit competitions.

2. The prize is a Two Weeks' Course in Live Stock and Seed Judging at the Agricultural College, January, 1916, railway fare to Guelph and return and two weeks' board.

3. The winner will be selected on the following basis:—

- (a) 50 points for the highest net profit.
- (b) 50 points for type and finish, this being done with bacon hog score card.

4. There must be 6 entries before a competition can be conducted, and unless 4 complete the contest no prize will be awarded. If there are 12 entries and 8 complete the contest, two men will be sent to Guelph. Entries close July 1st.

5. Each contestant must feed three hogs. A fourth hog may be fed and used as a spare in case of accident or disease.

6. At the time of entry the representative will inspect the hogs and mark with ear tag or in some equally suitable way.

7. Hogs are to be weaned at six weeks and fed and cared for by the contestant. An accurate account must be kept of the kind and amount of food consumed. Any

contestant who fails to fill out accurately the form supplied by the representative will be disqualified.

8. When the hogs are twenty-two weeks old they will be inspected and weighed by the district representative.

9. The representative will certify to the correctness of each report. All reports must reach this Department by December 1st.

10. At the conclusion of the Course at Guelph a competition will be held in the judging of live stock and seed, and a gold watch will be presented to the man showing the greatest efficiency.

11. Special prizes for the winners in these competitions will be awarded at the Winter Fair at Guelph and at the Union Stock Yards show. The Stock Yards will arrange for the sale of the hogs if the competitors so desire.

The Guelph Winter Fair Board kindly arranged to give special prizes for hogs exhibited by boys in the Feeding Hogs for Profit competition. Unfortunately the boys finished feeding their hogs too early in the season to take advantage of this generous offer. However, six boys took their hogs to Guelph and not only made a very creditable exhibit, but also succeeded in carrying off prizes in the open classes.

APICULTURE SHORT COURSE

THE sixth annual short course in apiculture was held at the Ontario Agricultural College, Guelph, January 11th to 22nd, 1916.

Owing to war conditions a large attendance was not anticipated. On the opening day, however, there was an attendance of twenty-seven, later increased to thirty-five young men and a few ladies. Practically every one of these had been previously engaged in beekeeping. They included beekeepers owning one hundred or more colonies, sons of successful beekeepers and in one case a beekeeper's hired man. Many different parts of Ontario were represented, also Quebec, and the state of Michigan.

It is the purpose of this course to

give the underlying principles of bee nature, a knowledge of which is essential to successful bee management. Fifty-nine lectures and demonstrations were given, covering the different phases of beekeeping. Typewritten copies of each lecture outline were distributed to the class so the main points could be followed closely and carried home for future reference. As far as possible the lectures were illustrated with stereopticon views and the actual objects under discussion. Members of the class were also given laboratory practice in hive construction, and a visit was made to the apiary of a successful beekeeper in the neighborhood of the college.

One important feature of the work was the display of apiarian apparatus and implements. The educational value of this was clearly demonstrated by the keen interest shown by those present.

In conducting this course, the Provincial Apiarist, Mr. Morley Pettit was assisted by F. W. L. Sladen, Apiculturist, Central Experimental Farm, Ottawa; F. E. Millen, B.S.A., Lecturer in Apiculture and State Inspector of Apiaries for Michigan; F. W. Krouse, President of the Ontario Beekeepers'

Association; James Armstrong, Selkirk; Vice-President of the Ontario Beekeepers' Association; also some of the apiary inspectors of Ontario. Lectures on allied subjects were given by other members of the College staff. Mr. Frank C. Pellett, State Apiarist of Iowa, paid the class a visit and lectured on beekeeping conditions in his state.

It is proposed to hold a Summer School for beekeepers at the Ontario Agricultural College, some time in June when bees are active and apiary practice will be possible.

NOTES FROM DISTRICT REPRESENTATIVES

SUPPLIED BY C. F. BAILEY, B.S.A., ASSISTANT DEPUTY MINISTER OF AGRICULTURE

DUFFERIN COUNTY

H. A. Dorrance, B.S.A.:—

"I beg to report that from observation and report, merchants in town are receiving poultry of a better kind and in better condition than has ever been the case around here. This, to my mind, is due to two things—first, to the work of distributing eggs in our school fair work and secondly to our work in calling the attention of farmers to improved methods of crate feeding chickens. We have received four cockerels from Prof. Graham and have arranged for a source of supply of eggs for our school fairs for 1916."

GRENVILLE COUNTY

J. E. McRostie, B.S.A.:—

"Last night a meeting of the Junior Farmers' Improvement Association was held in the Town Hall for the purpose of reorganizing the society for the coming year. I am pleased to say that every member of the society was present (twenty-six) except the three who went to O.A.C. last Fall. Copying from the minutes I have the following resolutions which will give you an idea of what was accomplished at the meeting:—

1. That meetings be held regularly once a month during the winter, the first one on December 18th.

2. That the programme be directly in charge of the programme committee, other than the one speaker for each meeting, who will be secured through the Department of Agriculture.

3. Besides the regular speaker provided that the programme consist of debates, public speaking contests, and social evenings as arranged by the various programme committees.

4. That the association send a County Stock Judging team to the Winter Fair at Ottawa to compete for the Peter White trophy.

5. That the association endeavour to get at least thirty members by the coming spring who will be willing to take part in Standing Field Crop competition work.

6. That the members undertake a Feeding Hogs for Profit competition.

7. That five members undertake to keep a flock of pure bred Plymouth Rock hens, under the supervision of the district representative for the purpose of supplying eggs for rural school fairs."

DURHAM COUNTY

R. S. Duncan, B.S.A.:—

"I have an item in regard to crop production which is worth recording from the county of Durham. A young farmer, by the name of Herman Peters of Canton, who lives five miles north of Port Hope, has threshed 86½ bushels of alsike by weight from approximately 7 acres. This seed has been sold to a seed merchant in Toronto for 18½ cents a lb. or \$11.10 per bushel. This is a total production of \$960.15 or \$139 per acre. This is almost a record in alsike seed production."

KENORA

P. Stewart, B.S.A.:—

"In addition to the experiments which we have arranged and supplied seed for at Guelph and Vineland on northern grown seed potatoes and seed peas, we have this week arranged with Mr. Hunt of the Horticultural Department to have thirteen varieties of flower seeds, grown on an island on the Lake of the Woods, tested out at Guelph against imported and domestic flower seed of the same varieties. On account of the ever increasing shortage of continental seed supplies we expect these experiments to give results which may prove of considerable commercial value to men in this district who are interested in seed production lines."

DUNDAS COUNTY

E. P. Bradt, B.S.A.:—

"We find that the leaflets which we are forwarding to the young men who have taken the course in agriculture with us are being much appreciated. The following is taken from a letter received by me this morning which is a sample of a number which I have received since starting this idea:—"I enjoy these leaflets twice a month which you are sending out. I have already put in practice quite a few of the suggestions. I have white-washed our stables and have been more careful in storing away our farm machinery."

RAINY RIVER DISTRICT

H. M. McElroy, B.S.A.:—

"The Potato Growers' are doing a good business these times. They have shipped three cars of live stock to Winnipeg, this fall, and have purchased two cars of apples. They have made arrangements to ship a car of dressed poultry in the next ten days."

GREY COUNTY

H. C. Duff, B.S.A.:—

"The Board of Agriculture met in our office on Saturday, December 18th. Victoria Club of Collingwood township presented a decidedly interesting and important report. This is the only club that has done much buying and selling. They happen to be suitably located for co-operative work and have secured good results in buying feeding stuffs, twine and other things required for the farm. Their greatest success has been in the selling of live stock. During the

year they have sold over \$25,000 worth of live stock. In addition they shipped three carloads of apples to some Grain Growers' Associations in the west for which they obtained excellent prices. The Board decided to have members of this club visit all the clubs in the county during the winter. It may be interesting to note that Victoria club meets every two weeks during the summer as well as the winter and this gives them scarcely enough time to carry out all their business transactions in addition to the regular addresses which they always have.

"A committee was appointed to ask the County Council for the renewal of the \$150 grant to the Guelph Winter Fair and also for an extra \$50 for the Board itself. With this money a pamphlet is to be prepared outlining the work of the Board, the success of the county exhibits at the Winter Fair and also the success of the County Judging team. In addition the pamphlet will contain a list of the breeders of pure bred live stock.

"During the November session of the County Council, the Reeve of Euphrasia asked the County Council to take steps to induce the Government to make it compulsory for land owners to treat grasshopper infested areas during any seasons that there is likely to be a bad outbreak. The movement was unanimously supported by the councillors and I understand a request is to be made at the next session of the Legislature. Judging from our experience with grasshoppers last spring, we consider the same sort of legislation is required to meet conditions such as we found them in this county. Many of our farmers had to go to great expense in destroying grasshoppers that spread from untreated areas to their own fields which they had successfully freed from all grasshoppers hatched therein."

BRANT COUNTY

R. Schuyler, B.S.A.:—

"Tuesday evening I attended the Tranquility Farmers' Club meeting and discussed the subject of "Care of Stock during the Winter." About sixty ladies and gentlemen were present. I was rather surprised at finding ladies there, or I would have prepared a talk along a different line than what I gave. This club has the distinction of being the strongest in the county this year. At the close of their spring meeting they inaugurated a membership campaign, dividing the old membership into two sides, the losing side to provide oysters for the club. The result has been that one side obtained 110 members and the other 65, a total of 175 members.

MANITOBA

SEED FAIRS AND POULTRY SHOWS

BY GEORGE BATHO, EDITOR, AGRICULTURAL PUBLICATIONS, DEPARTMENT OF AGRICULTURE

IT is ten years since the first winter seed fairs were held in Manitoba, the movement being inaugurated by the Seed Branch of the Dominion Department of Agriculture. Since that time this work has been assumed by the Provincial Department of Agriculture.

The series for the present winter season included a total of thirty-three, well distributed over the Province, and all but three held before the close of December.

Judges were supplied by the Manitoba Department of Agriculture and Manitoba Agricultural College, the judges in the Seed Grain section being Messrs. S. A. Bedford, L. V. Lohr, W. T. G. Wiener, Nelson S. Smith, J. H. Evans, D. Patterson, E. C. Myers, Geo. Jones and W. McWilliams. The judges in the Dressed Poultry section were: Prof. M. C. Herner, Assistant Professor J. E. Bergey and Messrs. L. V. Lohr, R. Salkeld, J. Bruce, W. T. G. Wiener and W. H. Brett.

At thirteen of these fairs Professor S. A. Bedford, Weeds Commissioner for the Department, judged grain. He reports the number of exhibits as being larger than in former years and excellent in quality. At a considerable number of points Mr. Bergey was the judge in the poultry section; and it is a noteworthy fact that whereas in former years only a portion of the societies held a dressed poultry show, this year every fair had its poultry section.

Possibly the best all-round displays were made at Killarney, Deloraine, Boissevain, Binscarth and Birtle. At Binscarth there were just one hundred exhibits of dressed

poultry. At Birtle the display of grain was the largest in Manitoba, and, in addition, an excellent collection of vegetables was shown. Evidently the soil there is adapted particularly to vegetable production. At Boissevain a special feature of some magnitude was the exhibit of excellent bread and biscuits baked from flour produced at the Boissevain flour mills.

At the close of each fair a public meeting was held at which addresses were delivered by the judges, who not only discussed the exhibits presented, but also spoke on some prominent phase of their work that seemed of timely or local interest.

In connection with the poultry industry, Mr. Bergey observed that the wholesale produce dealers of Winnipeg had remarked upon the improvement in the dressed poultry received by them since the inauguration of dressed poultry competitions at these fairs, practically showing the value of the educational work in connection therewith.

Much interest was exhibited in the Government's weed eradication propaganda as outlined by Professor Bedford. At each point the farmers were invited to offer an opinion as to the Manitoba Noxious Weed Act as it now stands, and to suggest improvements. Many alterations were proposed.

Some of the fairs occupied two days and some one day. The general opinion seems to be that where only one day is used, the programme is too crowded and the educational value of the fairs suffers in consequence. On this account it is quite probable that more two-day fairs will be held hereafter.

NOTES

The number of threshing machines in Manitoba during 1915, according to the Department of Agriculture, was 4,102, an increase of 132 over the year before.

Manitoba beekeepers are offered the free use of a circulating library on bee questions. The library is in charge of R. M. Muckle, Provincial Apiarist, Department of Agriculture, Winnipeg. The demand for bee literature, which recently has been quite heavy, indicates a growing interest in apiculture.

Preparations are being made for 1,000 delegates and other farmers and farmers' wives at Manitoba Agricultural College during "Farmers' Week," February 14th to 19th. During the week the following bodies hold conventions: Home Economics' Societies, Beekeepers, Seed Growers, Agricultural Societies, Poultrymen, Horticulturists, Ex-Students of M. A. C., and District Representatives. There will be a grain cleaning contest, an agricultural implement display, boys' grain judging contests, short course students' contest, a Soils Products' Exhibition, and an exhibition of the work of Home Economics' Societies. Very strong programmes of addresses both for men and women have been arranged, the speakers not only being drawn from all over Manitoba but also from outside points.

The staff of Manitoba Agricultural College is this winter more active than ever before, furnishing speakers for appointments in different parts of the province. During recent weeks the College staff has delivered an average of 42 lectures per week outside the College. Also,

in addition, considerable teaching material usually employed in the College work has been utilized in this extension service. A portion of these lectures have been given in connection with the country short courses; an average of 12 evening lectures per week have been provided in the public schools of Winnipeg, and other appointments have also been kept. The lectures to night classes in the Winnipeg schools have been the most regularly attended of all, and the instruction given has not only been useful to city folk who intend to begin farming, but also to those who will only be engaged in gardening on city properties.

One effect of the war has been to put new life into cheese making in Manitoba. For a number of years this industry has been on the decline until in 1913 only 400,000 pounds were made in the province. The war, however, with its big demand for so highly nitrogenous a food, furnished an excellent market for eastern cheese, and the Manitoba factories seizing the opportunity to supply the home trade almost doubled their make, producing, according to the Department of Agriculture's crop report, 726,725 pounds during 1915.

The Manitoba Department of Agriculture in its latest crop report states:—The gradual breaking up of the upland hay areas and the drying up of lower hay lands is responsible for a substantial increase in the total area sown to tame grasses. Our crop reports indicate that Western Rye grass and Brome grass are best meeting the needs of the live stock farmers of the province, brome being particularly reliable as a pasture grass. Timothy is not rapidly increasing in favour in this province.

The area planted to corn in Manitoba increased from 30,430 acres in 1914 to 52,713 acres in 1915, according to the official crop report. In view of the damage to the crop by frost, the report makes this comment: While the condition in 1915 cannot fail to create disappointment among farmers regarding corn, this crop is so firmly established in many of the older districts that it will continue to increase in popularity. In view of the unfavourable season for corn growing, there is every reason to warrant our confidence that this crop is still one of our most profitable fodder crops.

The only class of live stock showing a decline in numbers in Manitoba during 1915 has been pigs. The number of pigs in the province, according to the latest crop bulletin, was 286,433 in 1915 as compared with 325,416 in 1914. The greatest increase in any class of stock showed in cattle, there being 631,005 head in 1915 as against 498,040 in 1914. The increase in horses and sheep was slight in each case.

The increased interest in beekeeping in Manitoba is reflected somewhat in the fact that the honey produced in 1915 was over twice that of 1914. The 1915 crop is stated in the latest provincial crop report as being 104,655 pounds.

The record of the year 1915 has been a good one so far as the dairy business in Manitoba is concerned. There were increases upon 1914 of over a million pounds in the make of creamery butter, over 26,000 pounds in that of dairy and over 25,000 pounds in the output of cheese, while the increase in the total value of milk and milk products was over \$427,000.

A special contest has just been announced by the Manitoba Department of Agriculture for the students now enrolled at the short courses at Morden, Boissevain, Virden and Neepawa. From each of these schools a team of five students will be chosen. These will meet at the Agricultural College during "Farmers' Week" and will compete in live stock judging, grain judging and weed seed identification. To each student in the team securing the highest aggregate score a gold medal will be presented, while each student in the second team will receive a silver medal. To the student making the highest individual score a special cash prize of \$10 will be presented. The contests will be conducted by the Field Husbandry and Animal Husbandry staffs of the Manitoba Agricultural College.

BIG PRIZES GIVEN DURING "FARMERS' WEEK"

The list of prizes offered in connection with the annual Soil Products, Exhibition which takes place at Manitoba Agricultural College, Winnipeg, from February 10th to 15th, is by all means the most elaborate yet put forward. Besides very liberal cash prizes for various classes of cereals, grass and clover seeds, roots and vegetables, as well as a considerable number of cups, a total of 36 splendid special prizes have been donated by prominent firms of Manitoba. Among these prizes are the following: Gas engines, fanning mills, blacksmith's portable blower and forge, sectional book case, roll top desk, weeders, libraries and other valuable articles.

The home economics' section of the prize list has also been greatly enlarged.

Last year the bankers of Manitoba gave \$1,000 for prizes in a steer-feeding competition. This year they

are giving only \$500 and the other \$500 is being supplied by the provincial government. The competition takes place in March. The competition is open to boys over nine and under seventeen years of age, and grade steers or heifers calved in 1915; 1st, \$100; 2nd, \$90; 3rd, \$80; 4th, \$75; 5th, \$70; 6th, \$65; 7th, \$60; 8th, \$55; 9th, \$50; 10th, \$45; 11th, \$40; 13th, \$35; 14th, \$35; 15th, \$30; 16th, \$30; 17th, \$25; 18th, \$25; 19th, \$25; 20th, \$25. One of the cattle breeders' associations will supplement the first prize with \$50.

Nominations for the Clydesdale

Futurity inaugurated by the Inter-provincial Fair at Brandon, Manitoba, have closed with 47, namely, 20 colts and 27 fillies. The Futurity is for foals of 1915 to be exhibited at the Interprovincial Fair at Brandon in July.

At the request of the curling bonspiel committee, Professor J. B. Reynolds, principal of the Manitoba Agricultural College, has consented to hold a two-day short course for farmers attending the bonspiel. The lectures will be delivered in the Industrial Bureau, Winnipeg, on February 14th and 15th.

SASKATCHEWAN

SEQUENCE OF ANNUAL CROPS AT SASKATOON

BY JOHN BRACKEN, B.S.A., PROFESSOR OF FIELD HUSBANDRY

THE project that we have chosen to call the "Sequence of Annual Crops" gave us our first returns this year. It is planned in such a way that eighty different rotations are being studied. Incidentally it gave us considerable data relative to the value of intertilled crops as compared with both fallow and thickly sown crops as a means of storing and conserving moisture. To date, no moisture nor nitrate determinations have been made from the different plots in this project. The only means so far taken to measure the effects of the preceding crop on the yield of subsequent ones is the agronomic method, namely, the measurement of the yields. This is, no doubt, closely related to the moisture conserved, but is not necessarily in direct relation to it.

The figures below will speak for themselves, but it may here be pointed out that during the past year very satisfactory yields after all intertilled crops formed the out-standing feature of the results from the project. Most crops also did well after

peas, but in our opinion this was due more to the absence of stubble in the pea ground than to the fixation of nitrogen by symbiotic bacteria in the roots of the crop. The peas were not inoculated and showed no signs of nodules.

Another interesting result was the low yield of corn on fallowed ground. Ordinarily the fallow yields more corn forage than soil prepared in any other way, but during the past cool season it is quite probable that heat and not moisture limited the yield. This is the only explanation we can offer for the figures given for the corn crop.

Flax did better after peas and all intertilled crops than it did on fallow, and nearly as good on fall-ploughed wheat stubble as on fallow. This was no doubt also due to the fact that the fallow being colder produced a later crop which did not mature so satisfactorily.

The following are a few of the yields from the different rotations undertaken this year:

WHEAT

<i>Wheat after wheat</i>	24 bus. 51 lb.
" " <i>flax</i>	27 bus. 53 lb.
" " <i>peas</i>	32 bus. 7 lb.
" " <i>roots and potatoes</i>	33 bus. 25 lb.
" " <i>corn</i>	34 bus. 44 lb.
" " <i>fallow</i>	38 bus. 32½ lb.

SPRING RYE

<i>Spring Rye after wheat</i>	24 bus. 38½ lb.
" " <i>flax</i>	31 bus. 5¾ lb.
" " <i>peas</i>	30 bus. 15¼ lb.
" " <i>roots and potatoes</i>	32 bus. 38¼ lb.
" " <i>corn</i>	32 bus. 12¾ lb.
" " <i>fallow</i>	34 bus. 11¾ lb.

OATS

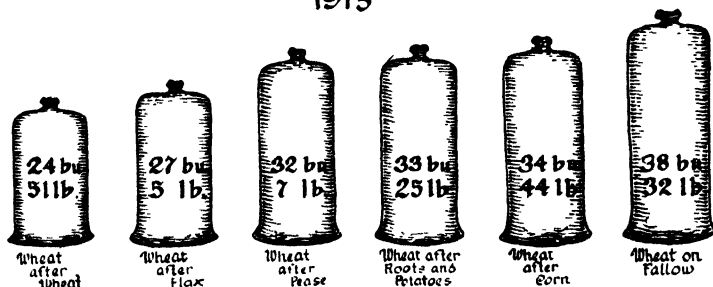
<i>Oats after wheat</i>	68 bus. 13 lb.
" " <i>flax</i>	66 bus. 31 lb.
" " <i>peas</i>	63 bus. 33 lb.
" " <i>roots and potatoes</i>	68 bus. 13 lb.
" " <i>corn</i>	69 bus. 29 lb.
" " <i>fallow</i>	81 bus. 21 lb.

POTATOES

<i>Potatoes after wheat</i>	158 bus. 4½ lb.
" " <i>flax</i>	222 bus. 58 lb.
" " <i>peas</i>	242 bus. 40 lb.
" " <i>roots and potatoes</i>	231 bus. 31½ lbs.
" " <i>corn</i>	272 bus. 11½ lb.
" " <i>fallow</i>	244 bus. 50 lb.

*Soil not quite comparable.

Influence of PRECEDING CROP on the YIELD OF WHEAT 1915



All land except fallow, fall plowed, double disced, packed and harrowed
in fall and double disced and harrowed in spring

BARLEY

<i>Barley after wheat</i>	29 bus. 45½ lb.
" " <i>flax</i>	31 bus. 37 lb.
" " <i>peas</i>	30 bus. 10 lb.
" " <i>roots and potatoes</i>	31 bus. 12 lb.
" " <i>corn</i>	36 bus. 47 lb.
" " <i>fallow</i>	38 bus. 13½ lb.

CORN

<i>Corn after wheat</i>	19,300 lb.
" " <i>flax</i>	22,300 lb.
" " <i>peas</i>	26,200 lb.
" " <i>roots and potatoes</i>	22,400 lb.
" " <i>corn</i>	28,200 lb.
" " <i>fallow</i>	14,650 lb.

*Suffered most from early spring frosts.

FLAX

<i>Flax after wheat</i>	19 bus. 27 lb.
" " <i>flax</i>	18 bus. 15 lb.
" " <i>peas</i>	23 bus. 38¾ lb.
" " <i>roots and potatoes</i>	22 bus. 23½ lb.
" " <i>corn</i>	26 bus. 28 lb.
" " <i>fallow</i>	21 bus. 36½ lb.

MILLET

<i>Millet after wheat</i>	5,841 lb.
" " <i>flax</i>	5,648 lb.
" " <i>peas</i>	5,921 lb.
" " <i>roots and potatoes</i>	5,947 lb.
" " <i>corn</i>	6,097 lb.
" " <i>fallow</i>	6,246 lb.

THE ROYAL COMMISSION ON LIVE STOCK

THE Royal Commission on Marketing Live Stock and Live Stock Products held eleven public sittings in Saskatchewan during the month of January, for the purpose of hearing evidence and receiving suggestions from any person who desired to discuss with them the subjects they were investigating.

The subjects on which the Commission were most desirous of obtaining evidence and which they particularly wished to have frankly and fully discussed were:

1. To what extent are producers of live stock handicapped in selling their product through their inability to make up complete carloads of live stock uniform in type and quality? Should all farmers in a district grow the same kind of live stock and co-operate in making up carload shipments? Should stock trains stop at several points to complete a carload, or to distribute a car of grade stock?

2. What difficulties are experienced by live stock shippers in connection with live stock shipping contracts?

3. What improvements are required in the facilities for the loading of stock and in movement of stock trains?

4. What is your opinion regarding the charge imposed upon shippers for the cleaning of stock cars?

5. What are the existing facilities for feeding and watering stock in transit? Are they adequate? Should live stock be

weighed "off cars" or "fed and watered"? Should all markets quote prices to the same method of weighing.

6. Should there be an independent weigh master for live stock, as there is for grain at Fort William?

7. What is your opinion regarding the charge by abattoirs of one half per cent insurance on all stock whether diseased or sound?

8. What market have you found the most profitable?

9. What experience have you had in co-operative live stock marketing?

10. To what extent do prices for live stock quoted in market letters by abattoirs and commission men differ from the prices actually paid?

11. Should drovers and commission dealers be licensed and bonded?

12. What are the principal grievances under the existing conditions of marketing Saskatchewan live stock?

13. Would these grievances or any portion of them be removed by the establishment of one or more abattoirs and live stock markets in Saskatchewan?

14. How should such abattoirs be financed, administered and by whom operated?

15. What guarantee, if any, of continued patronage should be obtained previous to their construction? How could they be enforced?

16. In looking to the solution of the live stock market, are you of the opinion that the interests of the consumer be considered in conjunction with the producer?

17. What in your opinion is the greatest deterrent and discouragement to the live stock industry in Saskatchewan?

LIVE STOCK DISTRIBUTION

WITH the end of November, the activities of the Live Stock Branch in connection with the Stock Distribution Policy concluded. The work last year was carried on most successfully, and only the lack of funds prevents its continuation during the entire winter, all of the \$50,000 voted for this purpose having been expended.

There was an increase in the number of cattle supplied in 1915. In

1914 a total of 433 head were supplied, and in 1915 the number was 456. While the number of milk cows distributed was not as great as in 1914, it is gratifying to find that the largest increase was in the number of western grade females and pure bred bulls supplied. In 1914 about 75 head of western bred grade heifers were distributed, while in 1915 over 180 were sold. The number of bulls rose from 24 in 1914 to 80 in 1915. The reason for this splendid increase

was due no doubt to the fact that an option calling for only a quarter cash deposit, instead of the fifty per cent in force before, was authorised early in the spring and added to the sale regulations. There is no quicker and cheaper way to raise the quality and standard of the Saskatchewan cattle breeding industry than by the introduction of high class pure bred sires, and it is hoped that this year farmers and stock-breeders in even greater numbers will avail themselves of this opportunity. Only about 30 of the bulls were bought in the East, the remainder being purchased from local breeders in the West. Thus the department is helping not only the individual in search of a pure bred sire, but it is also finding a market for the Western breeders of pure bred stock at remunerative prices.

Amongst other places, the districts around Rush Lake, Debden, Margo, Kerrobert and Kindersley received carload shipments of cattle. In Kerrobert, where a new creamery was established last year, approximately 60 head of milk cows were sold, while Kindersley received about 5 carloads of western-bred grade heifers.

That the action of the Department in distributing live stock is appreciated and thought well of by the Saskatchewan farmer is shown by the numerous enquiries received now by the Live Stock Branch, which unfortunately cannot be filled at present, but are being held over until the spring.

GREAT INCREASE OF SHEEP

Regarding the work with sheep, the increase has been more than fourfold. During 1914 about 480 grade range ewes and 12 pure bred rams were distributed under the Live Stock Sale regulations. In 1915 about 2,200 head of ewes and about 40 rams were supplied. No doubt this phenomenal increase was

due to the fact that there is an excellent market for both wool and mutton at the present time, which makes the raising of sheep a lucrative business, and which influenced farmers from all parts of Saskatchewan to start with a small flock. The 2 200 sheep were supplied mostly in lots from 20 to 100 and were scattered over the whole province, quite a few being shipped into the north-western section.

While it is not likely that the price for wool will remain at the high level which it now holds, once the war is over, there is no reason to believe that it will drop back to the figures prevailing a few years ago, namely, 9 to 11 cents per pound.

There is no branch of the live stock industry which needs encouragement more than the raising of sheep. Confronted with the serious weed problem, the slogan of our prairie farmers and wheat growers should be "Sheep on every farm," and they will maintain their reputation of having a "golden hoof" by keeping the summer-fallow clean, gleaming the stubble fields in the fall, and by turning otherwise wasted products on the farm into high-priced wool and mutton.

One gratifying feature from the live stock point of view is the fact that although Saskatchewan has been blessed with one of the heaviest and largest crops ever harvested, farmers are not losing sight of the live stock end, and quite a few enquiries and applications for stock are now being received from the districts from which reports of the highest yields have been received, viz: the south-western district of Saskatchewan, on the Weyburn-Shaunavon line and the Goose Lake country. This would indicate that the prairie farmer, after having garnered one of the best grain crops in years, is prepared and willing to invest part of his surplus cash in breeding stock. This augurs well for the future of the live stock industry of the province.

POULTRY MARKETING

POULTRY farming is a branch of farm work which hitherto has not received the attention it deserves. In order to encourage the industry, a co-operative poultry market and killing station was opened at Saskatoon under the direction of the Department of Agriculture and, after operating very successfully for three weeks, closed on December 24th. Professor Baker, of the Agricultural College, did the grading after the poultry had been prepared. Mr. Mawhinney of the Department of Agriculture was in charge of the station and was assisted by two expert killers. The total receipts at the

station for the three weeks were: turkeys 5,013 pounds, chickens 5,763 pounds, fowl 6,058 pounds, ducks 1,150 pounds, geese 475 pounds.

The following rates of advance were paid to the shippers: turkeys 15c. per pound, chickens 14c. per pound, fowl 10c. per pound, ducks 10c. per pound, geese 10c. per pound for first grade, 3c. lower in each case for second grade. Messrs P. Burns & Co., of Calgary, have purchased the bulk of the poultry sold to date. Shippers of turkeys and geese will realize at least 20c. a pound on the average for their products.

SOIL MOISTURE TESTS

DURING the past summer soil moisture demonstrations have been carried on in different parts of Saskatchewan for the purpose of obtaining facts regarding the amount of moisture retained by a well worked summerfallow and one not so well worked, also data regarding rainfall for the summer months.

The rainfall for each district was as follows: - In the south-western

16.5 inches, in the south-eastern 11.7 inches, and in the middle north-western section of the province 6.34 inches.

The number of soil samples taken was approximately 293. These were taken at intervals throughout the growing season at 1, 2 and 3 feet deep. These samples are being tested for moisture content.

A DAIRYING LECTURE TRAIN

A series of eighty lectures on the dairying industry is being delivered along the line of the Canadian Northern railway, extending from Lloydminster in the west to Togo in the east. Two passenger coaches have been fitted up as dairy instruction cars. Professor K.

G. MacKay, of the College of Agriculture, Saskatchewan, and Mr. P. E. Reid, of the Dairy Branch, Regina, are conducting the campaign. The lectures, which commenced on January 15th and will last until February 26th, are illustrated with scenes referring to dairying.

BRITISH COLUMBIA

BOYS' AND GIRLS' CLUBS OR JUNIOR FARMERS' INSTITUTES

MR. W. E. Scott, Deputy Minister of Agriculture, recently issued the following circular outlining the plans of the Department with regard to the organizing of Boys' and Girls' clubs or Junior Farmers' institutes:—

During the past two years this Department has organized and conducted boys' and girls' potato competitions. In 1914, twenty such competitions were held, and although this was the initial attempt of the Department along this line, the idea met with creditable success. During the past season, the number of competitions was increased, notwithstanding the fact that there were no cash prizes offered last year as an incentive. So popular indeed has this branch of the work of the Department become that we have decided to enlarge upon the system adopted in 1914 and so adjust it that all boys and girls may take part.

Heretofore, Boys' and Girls' competitions have been organized under the direct supervision of Farmers' Institute secretaries which limited the holding of such competitions to those districts in which Farmers' Institutes had been organized previously. We now propose the organization of Boys' and Girls' clubs or Junior Farmers' institutes. Such Junior Farmers' Institutes may be organized in any district under the supervision of the local Farmers' Institute or (in the event of the absence of such organization) under the supervision of any public official of the district.

The following are the regulations governing the membership and organization of Junior Farmers' Institutes:—

Any boy or girl from 10 to 17 years inclusive will be eligible for membership.

Any district wishing to form such Junior Farmers' Institute must secure at least 10 members before such organization will be recognized.

A membership fee of 25 cents shall be charged to insure good-will and cover postage on correspondence with the Department.

The officers shall consist of:

Club Organizer, President, Secretary-Treasurer.

The Club Organizer shall be an Honorary Secretary and will assist in the conducting of business of the Junior Farmers' Institute.

The President and Secretary-Treasurer shall be elected by the members from the members, and with the club organizer shall compose the executive committee which will direct the affairs of the club or Junior Institute.

The Secretary-Treasurer of the Junior Farmers' Institute shall forward as soon as possible after organization an application for enrolment, together with a list of officers and members with post office address of each.

We propose to allow the Boys and Girls clubs or Junior Farmers' institutes to choose from the following list the competition they wish to hold in 1916:—

Potato competition.

Corn competition.

Pig Raising competition.

Poultry Raising competition.

Market and Flower Garden competition.

Prizes will be awarded to the winners of local competition and sweepstake prizes for district and provincial winners.

A bulletin will be published during the early part of 1916, giving in detail the rules and regulations governing competitions.

Circular bulletins will be supplied free of charge to each Junior Institute member explaining the cultivation of crops, and stating the nature of the prizes to be awarded.

FRUIT PACKING SCHOOL AT DUNCAN

A provincial government fruit packing school was opened at Duncan, B.C., on Jan. 4th and continued throughout the week.

There were sixteen names given in, but illness, enlistment and bad

weather reduced the attendance. Mr. Frank E. Loveday, Dominion Fruit Inspector, Vancouver, instructed the pupils.

The apples used were the Ben Davies and Belle de Boscop varieties.

PART III

Rural Science

SCHOOL GARDENS

NOVA SCOTIA

BY L. A. DEWOLFE, B.A., DIRECTOR OF RURAL SCIENCE SCHOOLS

WE are still of the opinion that the school garden is not equal to the home garden as an adjunct to school work.

The number of home gardens cared for by school children increased from 700 in 1914 to 1900 in 1915. School gardens have made no material advance. After home gardening has made this side of education popular, the school garden will probably come to stay. But at

present we in this province seem scarcely ready for it.

To be sure there are notable exceptions. It would be difficult to find in any rural community a better school garden than that at South Berwick, King's County. This garden was started by a lady resident of the section, who was able to get the assistance of the school children in making and keeping up the garden. For two years she conducted



SCHOOL GARDEN, SOUTH BERWICK, KINGS COUNTY, N.S., JULY, 1915

it practically alone. Now, however, an enthusiastic and capable rural science teacher has taken charge of the school, and is giving the assistance that was so much desired. From this garden in 1915 was sold 100 boxes of strawberries and five dollars' worth of flower seeds. This

fall, a flower and shrubbery border has been prepared on two sides of the spacious school grounds.

Several schools are preparing for perennial flower borders. In nearly all cases, however, we are leaving vegetable culture to the home.



PART OF SCHOOL EXHIBITION AT BERWICK, N.S., SEPTEMBER 17TH, 1915

QUEBEC

BY J. C. MAGNAN, DISTRICT REPRESENTATIVE

THE school garden movement in the province of Quebec has been greatly helped by the school inspectors, the teachers and the school boards. The following statistics are interesting in this connection:

Years	Number of schools having a garden	Number of pupil gardeners
1912.	231	6,914
1913.	234	7,740
1914.	284	9,308
1915.	710	18,000

Four school fairs were organized in 1914. Last year, with the co-operation of the Deputy Minister and of the teachers, this number was

increased to twenty-nine. Exhibits were contributed by 2,300 pupils. Each fair was visited by an average of 1,200 persons. These fairs have greatly encouraged the pupils to take up the study of agriculture and called the attention of the parents to the educational system as a whole.

A number of pupil gardeners' clubs and school museums were also established during the year. With the co-operation of the Superintendent of Education, the Hon. J. E. Caron, Minister of Agriculture, has arranged to have given by the school inspectors to the school boards and the teachers over two thousand lectures on school gardening and agri-

culture in the school. It is not our intention to increase the number of school gardens this year, but to maintain those that have been established. They will be improved, in accordance with the experience gained during the past year, and a system of agricultural teaching will be organized, based upon the degree of instruction of the pupils and adapted to the requirements of the district and to the climate.

The establishment of pupil gardeners' clubs, of agricultural school

museums and home gardens will also be encouraged and new agricultural school fairs will be established.

It is hoped that this year the teachers and school boards will again co-operate with us and that our rural populations will grant us their support. In concluding, I may say that the educational part of the school garden is being more and more realized and the advantages of the agricultural profession are better appreciated by the rural school pupils.

ONTARIO

BY J. B. DANDENO, INSPECTOR OF ELEMENTARY AGRICULTURAL CLASSES

ONTARIO has always been cautious, perhaps over-cautious in undertaking new problems. This is seen in the attitude towards school gardens. As this is essentially a rural problem it is subject to rural ideas, which too often are non-progressive. The rural community assumes the attitude that it got along without gardens for a couple of generations, and why should it not continue to do so? Progress will necessarily be slow. Other difficulties present themselves.

The school grounds, for the average Ontario school, occupy about one-half acre, or, perhaps one acre, and this is for buildings and play grounds. If a garden is required, it will be necessary to secure more land. This looks to the farmer, quite frequently, too much of an innovation, and he waits to see what others may do.

There is no doubt that the teacher will be the chief factor in the development of the idea. But the teacher sees in it very little except additional work and responsibility and is frequently not qualified to direct the work successfully. Moreover, the garden is such a public part of the school work that the teacher fears failure, because in the garden it is so

easily seen. Other school work, if poorly done, is not so easy to see. But garden work is not so difficult as many teachers imagine. A certain amount of training is necessary; the more the better.

The teacher must be in sympathy with the work, she must be diligent and enthusiastic. She must be these in any case, else she should never be a teacher.

And the school garden is not simply a plot of land in which to grow things. It is an agricultural laboratory, an equipment that may be used in teaching every subject on the programme. It will be an inspiration towards the dignity of labour, and if the teacher has any of the spirit of investigation the amount of good she can do is immense.

To encourage the school-garden work and the teaching of elementary agriculture in rural schools the Department of Education offers grants in money to such schools as will seriously undertake the work. To a teacher with an elementary agricultural certificate carrying on the whole work successfully throughout the year, the Minister will pay \$40 to the teacher and \$30 to the board. To a teacher who holds a second class teacher's certificate, after 1915, and

who carries on the work successfully throughout the year, the Minister will pay \$20 to the teacher and \$15 to the board.

The Public and Separate School inspectors supervise the work and decide the matter of qualification for grants under the approval of the

Minister of Education.

It is expected that school gardens in the rural schools will have some tendency to prolong the teacher's term in each school. The more a teacher puts into a school the less likely she is to leave to undertake work in another school.

MANITOBA

BY H. W. WATSON, M.A., DIRECTOR OF ELEMENTARY AGRICULTURE

DURING the past year, a marked increase in interest has been displayed by both teachers and trustees in this branch of Education. Most of the new school sites, especially those in connection with consolidated schools, have been well fenced and have had land prepared for the planting of windbreaks, ornamental trees and school gardens. Many old sites that

the number of last year. The season was, however, rather discouraging to school gardeners, as it was to the farmers with their gardens. The spring opened early and was favourable for putting in garden seeds. The germination was all that could be desired and the plants were doing splendidly when heavy frosts about the middle of June cut almost everything to the ground. Teachers



GARDENERS OF ISABELLA CONSOLIDATED SCHOOL, MANITOBA

have not even been fenced have been improved in a similar manner.

Teachers and trustees are beginning to realize the value of making the school buildings and their surroundings as attractive as those of the best farm homes of the district.

RATHER UNFAVOURABLE SEASON

The number of school gardens was increased at least fifty per cent over

and children were compelled to do as most farmers did, namely, to re-plant with such varieties as were suitable for late sowing. For this reason the gardens were not in very good condition when the school closed for holidays. During July the garden material did well, but a heavier frost than usual again occurred about the time school re-opened in August, and cut off much before it had reached maturity.

However, many of the school gardens are reported to have been equal to or better than any other gardens of the district. Many teachers have advanced beyond the "playing at gardening" stage, and are making this work of real educational value in relating it to the other subjects on the curriculum and to the interests of the home. Many teachers, who have been most successful with their school gardens, have adopted the plan of limiting the varieties grown by a single pupil, or even by an entire grade, to one or two at most. The advantages of such a course are:

1. The pupil learns to grow one variety at a time more successfully.
2. The teacher can select a variety suitable to the age and ability of the pupil.
3. The pupil, or pupils of a grade, will thus grow sufficient of a given variety to make the sale of the quantity worth while.

SUGGESTIONS FOR GRADING

In order that interest may be sustained throughout the full public school course and that the subject be made properly educative, I am convinced that teachers should follow a plan as in arithmetic, grammar or other subjects, and proceed from the simple to the more difficult, year by year introducing some new and more advanced stage in the subject. As a guide to the teachers of this province, I have made out the following suggestive outline:—

Grades 1 to 3.

Radish	Nasturtium
Beans	Poppy
Peas	Candytuft
Beets, 2nd crop	
after Radish or	
Beans.	
Turnips.	

The work in these grades should merely aim at interesting the pupils in the growth of plants. The knowledge of "how and why" should be gradually obtained in the succeeding grades.

Grades 4 to 6.

Onions	Marigold	Wheat
Carrots	Calliopsis	Oats
Parsnips	Eschscholzia	Barley
Potatoes	Mignonette	
Corn	Perennials	

A pupil should not grow more than two varieties of vegetables each season, and he or she should learn to grow these successfully.

Grades 7 to 9.

Cucumber.	Wheat (3).
Cabbage (early sowing).	Oats (3).
Tomatoes (transplanting).	Barley (3).
Corn (different varieties).	Alfalfa (2).
Potatoes (different methods of planting and cultivation).	Grasses.

Sweet Peas.	Maple.
Morning Glory.	Ash.
Gaillardia.	Elm.
Aster (early sowing).	Lilac.
Stocks (transplanting.)	Honeysuckle
Perennials.	Caragana.
Bulbs.	Snowball, etc.
House plants.	

In connection with the vegetables and grains, the work should be largely experimental. Different varieties should be used under the same conditions, or the same variety under different methods of planting and cultivation. The keeping of records of growth and yield, cost accounts, etc., should be an important feature of the work in these grades. An individual pupil should not attempt many varieties.

DEPARTMENTAL ASSISTANCE

The Department of Education assisted teachers and trustees considerably by furnishing material such as trees, shrubs, and seeds, either free or at wholesale cost.

During the year the following material was thus distributed:—

	Free
Germination Testers.	960
Egg Testers..	200
Wheat, oats, barley, corn.	7,500 pkts.
Potatoes (three varieties).	1,800 "
Alfalfa for small plots.	2 bush.
Tree seedlings..	12,000
Vegetable and flower seeds.	
Wholesale cost..	8,000 pkts.
Shade and ornamental trees.	4,950
Perennial flower roots	600
Bulbs..	7,000

The greatest drawback to the success of gardens at school is the lack of care during the summer vacation. Many teachers keep the plots in good condition until school closes, but fail to organize the pupils for care during holidays; consequently some return to find the flowers or vegetables choked out by weeds or eaten off by animals. However, most teachers find some way of successfully overcoming the difficulty. Some teachers reside in or near the district and arrange with the pupils to meet regularly and weed the plots. In many districts the trustees award prizes for the best kept gardens. In sundry of the village schools the janitor or some of the older boys are engaged to attend to the seeding and cultivation.

MUNICIPAL AND PARLIAMENTARY PLANS

In a number of schools last season, the garden work was linked up with

the subject of Civics. The entire plot was surveyed as a province, with its municipalities, townships and sections and the necessary government in connection therewith. There were the Premier, members of parliament, municipal councillors, road inspectors, weed inspectors, sale committee etc., all of whom were appointed or elected according to the laws of our province.

I know of one school which had a large number of individual plots where such an organization was extended to include several provinces, with a federal form of government.

Many of the vegetables that are grown in the school plots are used by the children in their hot mid-day meals. In villages and towns where such was not done and where considerable material was grown, a sales committee was appointed and the proceeds were used to procure school-room supplies, play-ground equipment, etc., or donated to the patriotic fund.

SASKATCHEWAN

BY A. W. COCKS, B.Sc., DIRECTOR OF SCHOOL AGRICULTURE

ACCORDING to the report for the year 1914 there were 370 school gardens in actual operation in the province of Saskatchewan, while preparation for the work of school gardening had been made in many other school districts. It was further stated that a large number of pupils operated home garden plots under the supervision of the teachers.

Early in 1915 the Departments of Education and Agriculture endeavoured to stir up enthusiasm for school garden work among the teachers of the province. The two directors of school agriculture who were appointed in the spring,—F. W. Bates, M.Sc., and A. W. Cocks, B.Sc., addressed many teachers' institutes and various public meetings through-

out the province. The inspectors of schools gave great assistance, not only by arousing the interest of the teachers and trustees, but by the organization of committees for rural education associations and school fairs. The agricultural secretaries of the municipalities and the District Representatives of the Department of Agriculture also lent their very valuable assistance to this work.

A SUCCESSFUL CAMPAIGN

The result of such a campaign has been remarkably successful, for although the Department has no definite information as to the exact number of school gardens which have been in operation during the year, yet from the reports of the inspectors of schools it is possible to estimate

that at least 1,500 schools undertook the work. In some cases the work was carried on by the pupils in their own home gardens, but so long as this is under the supervision of the teacher the Department recognizes it as school gardening. It is to be regretted that more than 50 per cent of the school gardens could hardly be considered successful. Many reasons could be given for these failures, such as destruction by gophers and drought; neglect during holidays; change of teachers and insufficient enthusiasm to carry the work to a successful conclusion. However, a great advancement has been made and one evidence of the progress is

quately explain the organization:--

"Each pupil of this school felt proud to consider himself a member of the students' parliament, under which with the general supervision of the teachers the management of the school garden was placed.

"The House being restricted to five constituencies, namely: Qu'Appelle, Prairie, Muscowpeetung, Tekahionwake and Valcartier, made it necessary to divide the garden into five rows, each one bearing the name of a constituency. These rows were divided into twelve plots each, leaving a small bed at the end for the constituency emblem. Besides the constituency rows, occupying the north end of the garden, were left three plots, two of which were allotted to grades 1 and 11 and the other for experimental purposes on four different varieties of corn and of potatoes. For protection, at the extreme



A SCHOOL GARDEN IN SASKATCHEWAN

seen in the large number of school fairs which were held in the fall.

As usual, it was found that owing to the correlation of the garden work with the regular class work a greater interest in school life was exhibited by the pupils. The attendance was improved and the work of the school generally raised to a higher level. A few particular methods of conducting the work are worthy of attention. The splendid organization of the work at the Qu'Appelle high and public schools is the result of the deep interest of the principal, Mr. R. F. Meadows, and his staff in the school garden movement. The following, which is a quotation from the report of the Secretary of State, will ade-

north end, a triangular plot the width of the garden was left to grow sunflowers.

"The members of the parliament were given the privilege of an entire plot in their own constituency row. The numerous other plots which were not taken by the members were sub-divided in half and given to the care of the higher public school grades, making each pupil responsible for his special plot.

"Now it must not be thought that each gardener seeded his plot in a haphazard manner. Each grade was given a choice of flowers and vegetables to grow, suitable to his grade. Grade 1 seeded turnips, whilst grade II sowed beets and sweet peas; thus learning the difference of size and the depth in which each plant will thrive. The intermediate classes had a choice of three from four varieties, whilst grade VIII sowed such seeds as tomatoes, cabbages and dahlias, thus learning the method of transplanting. The high school

pupils devoted their plots principally to experiments on carrots, beans or onions.

"By offering a prize of twelve dollars to the constituency having the best showing of marks, the Premier on the advice of his Cabinet appointed a committee of judges to judge the garden every two weeks. The method of judging was done by the guidance of a score-card with the allowance of thirty marks for general appearance, fifteen for condition of cultivation, thirty

"At the close of the school term the Minister of Agriculture advertised for tenders to see to the general care of the entire garden during the holiday months at a small salary. Several applications were received and the applicants given authority to sell radishes and lettuce, the proceeds of which were put in the garden funds."



SCHOOL GARDEN, INDIAN HEAD, SASKATCHEWAN, RURAL MUNICIPALITY
PLAN, JUNE, 1915

for absence of weeds and fifteen for abundance of growth. Each judge was given a score card to fill in what he thought should be given under the different conditions. After every judging his card was handed in to award each constituency the average obtained. In this way the constant care of the gardens was made compulsory.

ON THE MUNICIPAL PLAN

In several districts, notably at Indian Head and Weyburn, the garden work was organized on a municipal plan and the following description of the work in the Souris



SCHOOL GARDEN, INDIAN HEAD, SASKATCHEWAN, RURAL MUNICIPALITY
PLAN, SEPTEMBER, 1915

school, Weyburn, will be sufficient to indicate the system:—

"The garden was surveyed and arranged geographically after the plan of the province of Saskatchewan. There were three rows of townships running east and west and three ranges running from north to south: thus the garden constituted a model municipality containing a specified number of townships and each township containing thirty-six sections. The section, township and range, with the name of the pupil owning that particular plot, were marked on a small wooden tablet at the end of each section. Each pupil was supposed to have a farm of one section, that is, six feet square. One row of townships on the south and one row on the north were called forest reserves and were planted with a variety of shrubs and trees. The experimental farm was located at the

gardens was sold and the proceeds donated to the various patriotic funds. As the results of such a sale at the Yorkton school fair two beds were provided for the Saskatchewan Hospital Unit.

RURAL EDUCATION ASSOCIATIONS

The rural education associations already established in the province have been of great assistance in producing a greater interest in school garden work and many of the school fairs have been organized by these associations. It is hoped that next year in each rural municipality there will be a rural education association and an attempt will be made to



EVERYBODY WORKS! BIRCH HILLS SCHOOL, SASKATCHEWAN

eastern side of the garden. In the centre of the school garden, which represented a rural municipality, was an urban centre—the city of Weyburn.

"The management of the garden was carried on by the pupils who early elected their officers. A lad of twelve was elected reeve and another of eleven, secretary-treasurer. A council was elected by the members of each division. These officials appointed their weed inspectors, secretary-treasurer and other officials, while a set of books for the finances of the district was also provided."

It is interesting to note that in some portions of the province, particularly those parts settled by non-English speaking people from Europe, the produce of the school

cover the whole province by this organization. The members of these associations will consist of the teachers of the municipality, school trustees, agricultural secretaries and others interested in the work. The object of the associations is to arouse interest in the great educational value of the school garden; to provide means for profitable study and discussion of the various phases of the work; to promote and develop the use of the school garden as a means of more efficient teaching and to organize demonstration and school garden work valuable to the agricultural interests of the community.

Probably many of these associations will find it advisable to hold a school fair, to organize contests for boys and girls, to promote the formation of boys' and girls' clubs and to provide opportunities, by means of entertainments, lantern lectures, etc., for social gatherings in the community.

The Department of Education hopes that this work will result in establishing numerous centres of activity and that the directors of school agriculture will thus be enabled to act as an exchange by which special features worthy of encouragement will be made known throughout the province.

BY ETHEL H. FERGUSON, TEACHER, SOUTH WEYBURN SCHOOL

SCHOOL gardening was first undertaken in South Weyburn, S.D. 670, in 1914. On the advice of Inspector Kennedy I asked the school board to rent a portion of a neighbouring garden, but we were given all the land we required free of rent, the land being ploughed for us the third week in May.

Each child experimented with one variety of vegetable. In addition flower seeds were sown in a round bed in front of the school. The boys were given, in addition to their vegetable plot, plots in which were sown Marquis and Red Fife wheat, oats and flax.

These gardens created much en-



VIEW OF THE SCHOOL GARDEN, WEYBURN, SASKATCHEWAN

The children, under my supervision, surveyed the plots, staking them ten by five feet, with two feet walks between the plots and three feet between the rows.

The children brought the seed used from their homes, and we used what tools we could borrow from the neighbouring farms.

thusiasm among the children and the dull pupil became interested as he watched his corn rival that of his neighbouring gardeners.

In September when the school garden exhibition was held in Weyburn, these children won forty-two prizes—forty-two books.

When the prizes were to be dis-

tributed we prepared a short programme, to which the parents were invited. School gardening was discussed and all agreed to assist during the following year.

Last spring the school board purchased a half acre of the above-mentioned neighbouring garden, and a passage was made through the trees connecting it with the school-yard. On the north and west this garden is protected by a windbreak of poplars, on the east by a high caragana hedge and two rows of raspberry bushes, and on the south by a caragana hedge and lilac bushes. This time the school board staked out the plots, making each ten by six feet, and each walk five feet wide. There were thirty-three beds in all.

In the walks between the rows trees were transplanted, a large plot being made for perennials and shrubs, another plot sown in grains, while the remaining portion was used as a

community vegetable garden.

The board provided the seed and each child was given three varieties of garden vegetables and flower seed. As ten of the children ranged from five to seven years, the older ones assisted them in arranging and planting their plots.

During the summer vacation, despite handicaps, the children kept their plots free from weeds, *though some come three miles to do it.*

The enthusiasm has not diminished, every child being devoted to the garden and liking to talk about it. One sturdy chap remarked: "I can grow bigger beets than daddy."

This fall our school won fifty-seven prizes in the school garden exhibition held in Weyburn, also four community prizes.

At the exhibition our vegetables were sold and the proceeds donated to patriotic purposes.

BY CHAS. J. MACKAY, PRINCIPAL, SOURIS SCHOOL, WEYBURN

IN the fall of the year 1914 our garden grounds were well manured and ploughed shallow. In the spring of 1915 the ground was ploughed deep, thus leaving the manure about the right depth to



THE PRODUCE OF THE PUPILS' GARDENS

benefit the plants, and the ground was then well worked down with disc and harrow.

The 1915 the plan of our garden was based upon that of a city. There were four wards, numbered 1, 2, 3, 4; each ward consisting of 15 lots, thus making in all 60 individual lots. In the centre was a circular lot about 7 feet in diameter, representing municipal building sites. This lot was planted with perennial flowers. The pathways running north and south, east and west, represented streets and avenues, those running north and south were streets, while those running east and west were avenues. These were named by numbers. Each individual plot measured 8 feet by 12 feet. The whole city comprised an area of ground measuring 100 feet long and 87 feet wide. In addition to the city proper there were community flower and vegetable gardens. West of the city limits a strip of ground 12 feet wide, running the entire width of the city, north and south, was divided into three equal community flower gardens. East of the

city limits a similar strip of land, 59 feet wide, was divided into three equal community vegetable gardens. The above plans were drafted by the teachers and pupils concerned, and approved by the inspector, Mr. A. Kennedy, M.A.

Considerable latitude was given the pupils as to kinds of vegetables and flowers to be grown. It was decided by an unanimous vote of the pupils that the north half of each individual plot be devoted to flowers, and that the south half be devoted to vegetables; that potatoes and cabbages be grown in the community vegetable gardens, and that sweet peas, geraniums, petunias, asters and gladioli be grown in the community flower gardens. It was also decided that border flowers be sown around each individual plot. All pupils sowed the same kind of border flowers east and west, north and south. This arrangement produced a pleasing effect when the flowers came into bloom.

Garden records were kept by each pupil interested in the work. In these record books were recorded such interesting observations as garden cultivation, preparation of soil, time and depth of sowing seeds, weeds, weather conditions, conservation of moisture, etc.

We are glad to be able to say that our garden venture in 1915 was quite successful, as shown by the exhibition held early in September. The best samples of vegetables and flowers produced in the garden were placed on exhibition in the class rooms. These were judged and prizes awarded for the best exhibits. Vegetables and flowers produced in the community gardens were sold and the proceeds donated by the pupils to the Saskatchewan hospital unit.

Before freezing up our garden was again well manured and ploughed, and the pupils are looking forward with hope and pleasure to the coming spring.

ALBERTA

BY J. C. MILLER, D.Sc., PROVINCIAL DIRECTOR OF TECHNICAL EDUCATION

THE last was the first year during which the special Government grants in aid of instruction on science, agriculture and gardening have been in effect. For three summers, courses in those subjects have been offered at the summer school for teachers to enable them to qualify to carry on the work successfully and thereby earn for themselves and their school board the grant allotted for this work. About four hundred teachers have completed one summer's work in agriculture and gardening and one hundred the two summers' work in agriculture and gardening. Seventy-five teachers have now completed the two summers' work in nature study, agriculture and gardening required to secure the special certificate in elementary science, which a teach-

er must hold to be eligible for the special grant. Thirty-five teachers responsible for instruction in science and agriculture in high schools have completed one summer's work in the special courses in these subjects organized especially for them.

PUBLIC APPRECIATION

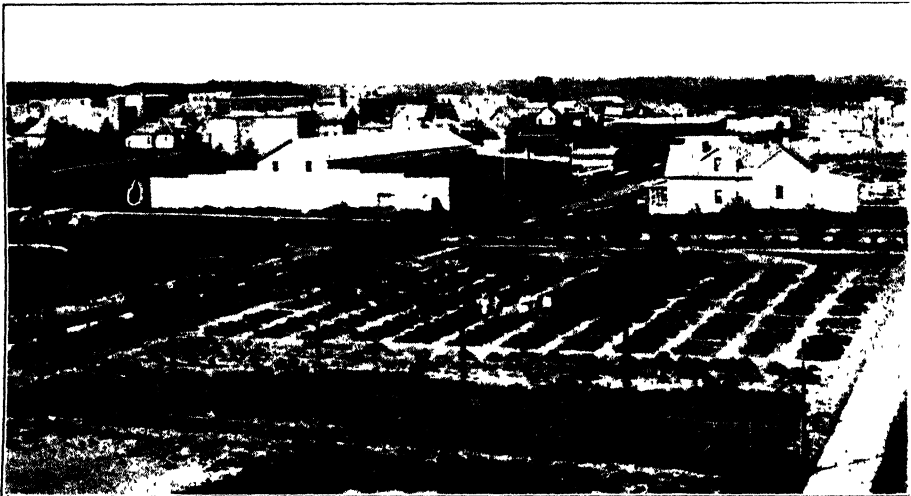
That the value and importance of giving practical instruction in agriculture and gardening with a scientific basis in the public and high schools are being realized by the public is shown clearly by the extent to which local districts have undertaken the work and the number of districts preparing ground for the introduction of practical gardening this year. Not only the rural schools but also many of the town and city schools

made a very creditable beginning last year. Three of the city schools in Edmonton, one of the schools in Lethbridge, the schools in Camrose, Ponoka, Wetaskiwin, Olds, Stettler, Wainwright, Coaldale and Blairmore have made good progress. Some work is being done in at least one hundred of the rural schools. In several the work is of a distinctly superior character.

THE PLAN PURSUED

As agriculture is an examination subject in Grade VIII and again in Grade XI, and as emphasis is placed upon the practical phases of the work in nature study which precedes the agriculture of Grade VIII and the

work in botany, zoology and physics which precedes the agriculture for Grade XI, when the practical gardening is undertaken in the village and town schools, the usual practice has been to include the whole school, including the teachers themselves in the garden plan. Quite properly the upper grades, high school students and teachers utilize their plots for experimenting, testing and demonstration work, while the lower grades give their attention to methods of cultivation and becoming familiar at first hand with the varieties of vegetables, flowers, vines and shrubs that can be grown successfully in this district and the varying methods of cultivating and caring for them.



SCHOOL GARDEN, RED DEER, ALBERTA

Showing plots of pupils and teachers of the Public and High Schools. A splendid example of what can be done in town districts

EDMONTON CITY SCHOOLS

IN the city of Edmonton an effort was made at three of the city schools to carry on school garden work. In each case it was a woman teacher who assumed the chief responsibility and in two cases it was the primary teacher. All three teachers, Miss Cuming, Miss Good-

man and Miss Bell, have been students at the summer school for teachers. The most successful as well as the most extensive garden was at the Highlands school. Its success is largely due to the untiring energy and effective leadership of Miss Elizabeth Cuming, who was

assisted by the active co-operation of the other teachers on the staff, especially the principal, Mr. Davis, and Miss Laughlin, another teacher who has had the advantage of instruction in agriculture and gardening at the summer school.

The superintendent of schools, Mr. W. G. Carpenter, gave the teachers every support and encouragement.

The school grounds not being available on account of building operations going on, vacant land across the street from the school owned by Mr. W. J. McGrath, was placed at the disposal of the school for garden purposes. The year before the ground had been broken and partially cleared and planted in potatoes. Early in the spring it was ploughed and disced and the boys of Grades VII and VIII cleared away the remainder of the brush and stumps.

The general plan provided for a two-foot grass border around the fence line with a three-foot pathway inside and adjacent to this border. The ground thus enclosed was divided into plots 4 by 10 feet with a two-foot path between them. In the centre of the plot of ground was an old basement filled with roots and manure and covered with water and matted slough grass. After much labour this was fixed into the most interesting and ornamental spot in the whole garden—water, rockery and flower garden effects. The flowers planted were dwarf nasturtiums, golden glow, larkspur, co'umbine, sweet William, pinks, spireas, dahlias, petunias, pansies, poppies, stocks snapdragon. For borders alyssum, verbena and lobelia were used.

The general plan of the garden being laid out, and each pupil with the exception of those in Grade I, having made and drawn the plan for his or her own garden plot, the garden was prepared and planted. Each child planted six rows of vegetables and the remainder of the plot in flowers. In Grade I each child was responsible for only half of one of the standard plots.

Some experimental plots were arranged for the senior class involving various tests for seed in relation to growth and condition (a) large and small, (b) frosted and normal, (c) whole and broken, (d) deep and shallow sowing, (e) thick and thin seeding.

The summer house or garden bower was made with linoleum poles given by the Hudson's Bay Company. Around it were planted canary bird vine, hops, tall nasturtiums, African pipe gourd and runner beans.

The ladies of the Highland's Improvement Society, of which Miss Cuming is a member, provided sufficient funds to secure two prizes for each room, a first for the boys and a first for the girls. Committees were appointed to take turns in visiting the garden and co-operating with the children in keeping it up to standard, especially during vacation.

At the close of the garden season a special day was arranged to which the parents, members of the school board and officials from the Department of Education were invited.

TABER'S SUCCESS

The most successful town school garden was the one in Taber, a town near the city of Lethbridge and in the dry farming belt.

No fewer than five of the teachers on the staff have attended the summer school for teachers one or more summers. The principal, Mr. Lynd, was one of the thirty-five high school teachers to take advantage of the courses offered last summer.

In their efforts to develop instruction and practical work the school board were helped greatly by the active interest and support of the Women's Institute and the Agricultural Society. The two acres of ground adjacent to the school used for the garden were placed at the service of the school board by the Hon. A. J. McLean. Early in the spring this land was cleared, ploughed and thoroughly cultivated, no less

than twenty loads of manure being worked into the soil. A small water tank was installed at the end of the garden in an elevated position so that hose could be used in watering. The school board provided funds for equipment, initial clearing and cultivating and the water tank. The Agricultural Society and the Women's Institute provided seed and money for prizes. Superintendent Fairfield of the Dominion Experimental Farm at Lethbridge assisted by supplying special seed potatoes for about twenty

"We arranged the plots—over 250 in all—as recommended by Dean Howes at the summer school. The rows were three feet apart and the plots within the row 2 ft. apart. The size of the plots was 4 by 10 feet. The rows were lettered and the plots numbered—G. 8 would be plot 8 in row G. If the number indicated the township the letter indicated the range. Each pupil of the upper grades had a plot. Some of the high school pupils had two plots each, one for vegetables and one for flowers. In



SCHOOL GARDEN, TABER, ALBERTA, 1915
Showing plots of the pupils of Grades 1 to XI, inclusive

ty boys who undertook to demonstrate this production.

In judging, the following system of rating was used:

Arrangements...	15	points.
Cultivation.....	25	"
Freedom from weeds.....	20	"
Vigour, Maturity and general effect.....	40	"

Mr. Lynd in writing of what may be spoken of as the school side of the work says:

addition to these individual plots larger spaces 12 by 12 feet were allotted for vines.

"In the high school plots we experimented with three fertilizers to test the need of the soil for nitrogen, potash and phosphorus. In the same plots we also tested thick and thin sowing, e.g., the east and west halves of a plot were treated with different fertilizers while the north side was sown more thickly than the

south side. The only observable difference made by the fertilizer was in the case of the peas where the soil without artificial fertilizer grew larger vines than did the soil treated with potash. The south side of the plot was sown at the rate of a pea to every inch. The latter grew just as large as the former and appeared to protect each other more. The grains dealt with in this manner were flax, corn, small oats, large wheat, small grained wheat, alfalfa and millet.

"The pleasure and profitable experience of the community, children and teachers in the work this year will lead to even better results next year. As there is land to spare it is planned to make arrangements with the Dominion Experimental Farm to have a small demonstration unit and to do considerable in planting trees and shrubbery. If the plans of those interested are fully realized the school garden grounds will become the beauty spot and an inspiration to the children and community."

IN SOUTHERN ALBERTA

The most successful rural school garden was the one in the Harvey School district near Vulcan in the dry farming and windy belt of Southern Alberta. Miss Annie Boler, who is in charge of this school, in writing of the work of this year says:—

For schoolroom decoration we have seeds of annuals planted, and indeed, already well in evidence. Our twelve gladiolus bulbs have already reached a height of more than one foot. We also have balsams (single and double) well out of the ground, marigolds (many varieties), ice plants, pansies, petunias, poppies, mignonette, sweet alyssum, candy-tuft, golden waves, nasturtiums, four o'clocks, geraniums, portulacac, zinnias, asters, bachelor's buttons, phlox, California poppies, larkspurs, stocks, snapdragons and carnations.

We have various perennials started for late blooming this year, including acroclimms, chrysanthem-

ums, sweet William, Canterbury bells, pinks and numerous specimens which I procured for early blooming from the nursery of hollyhocks, double daisies and forget-me-nots just planted for next year's blooming.

For experimental work we are testing wheat and oats, the pupils selecting good and poor kernels of each and planting them side by side to see which would produce the better plants, and finally the better seed. They are testing also the methods of



HARVEY SCHOOL GARDEN

The pupil gardeners are beside the plot for testing quality and vitality of wheat seed

planting beans with one, or two, or no cotyledons. They tested the wheat seed in cotton batting to see the requirements for the growth of the plant and to see if a sufficient number would sprout to warrant the planting of such seed extensively.

Our garden plots, 23 in number, one for each pupil, are each 10 ft. 9 in. by 13 ft. 9 in. with 2 ft. 6 in. walk between each. They are situated along the southern end of the school

yard. Each is bordered with rocks which will be whitewashed. About the north, west and east of each plot is a row of sunflowers, which serves as a protection against strong winds and hail, and to hasten growth for production of seed before frost if possible. We have a gravel walk from the gate to the school. At each

and vegetable marrow with some pumpkins as well.

In his report on the school, Inspector Russell confirms what Miss Boler has written and adds: "Each pupil was made responsible for weeding and caring for an individual plot, but larger pupils occasionally assisted the smaller ones. The work



HARVEY SCHOOL GARDEN
Sunflower borders are used as protection against the wind

of the eight windows in the school-house there is a small garden in which are planted scarlet runners, canary bird vines, Japanese hops, wild cucumbers and morning glories. At the north, east and west of the school yard we will have a fire-guard in which trees will be planted at some future date. On the south side of the shed is a cold frame in which we have planted squash, muskmelons, watermelons, cucumbers, citrons

was done at recess and during the noon hour. On only two days was a part of the school class time taken.

The use of canvas sacking securely fastened to sticks practically secured certain plots from the devastation of gophers. Seed of all vegetables and flowers grown were ripened and preserved for use next year. All this was accomplished in the open country on land where dry farming conditions appertain.

BRITISH COLUMBIA

IN his report for last year, Mr. J. W. Gibson, Director of Elementary Education for British Columbia, deals at length with the subject of school gardens. The following quotation is taken from this report:

"I have endeavoured to point out, not only to teachers, but to trustees and people generally, that elementary agriculture in the schools is concerned with living things and life-processes in the world around us, and not with statements found in books about agriculture; that it is based upon first-hand knowledge gained by each individual child through the exercise of his own powers of observation; that it may and should begin in the primary grades, in what is coming to be known as nature-study, and that in senior grades it is nature-study applied to those things of the natural world with which we work in the production of our food and clothing. In other words, agriculture in the schools is applied nature-study, and as such calls forth the child's activities in seeing and doing as well as in thinking and understanding. This at once suggests a method of teaching which characterizes all good nature-study, and shifts the emphasis from the subject-matter to the child. The child becomes the centre of interest. He stands 'in the midst' of everything pertaining to schools and educational systems; he learns by the daily exercise of his mental faculties, and these he alone can exercise. The wise teacher will provide the opportunities and give lines of direction. The child's early life is one of continuous discovery, a daily enrichment of experience.

"It is at this point that the school-garden comes in—a sort of out-of-doors laboratory where the child is able to combine bodily activity and dexterity with mental alertness and discovery. Mere skill in garden-making, whilst somewhat of an accomplishment as well as having a practical value, is not the main purpose of the school-garden. Indeed, we must recognize that school-gardening is vastly different from any other kind of gardening. Ordinarily, the value of gardens is computed in terms of the money value of the crops produced, but the value of the school-garden should be estimated in terms of its influence upon the gardeners. Unless they have gained valuable knowledge through experience in their gardens, and unless they have had new and wholesome life-guiding interests aroused and have become more appreciative of the value and beauties of life and their own growing ability to add to or take from it, they have not

experienced the real value of the school-garden."

THE BEGINNING OF PRACTICAL AGRICULTURE

"Elementary agriculture, therefore," Director Gibson continues, "begins with general nature-studies and progresses through school-gardening and other direct methods of observational study and experimentation towards the clearer understanding of those fundamental principles which are the basis of practical agriculture." Ten lessons in school-gardening are given in the Preliminary or First-year course and also to Group A. in the Advanced or Second-year course in Rural Science. In the first course the curriculum calls for the study of garden plans; tools and equipment; the making, planting, and care of garden plots; observational studies based upon the school-garden; suitable varieties for planting in school-gardens; garden records and diaries; various types of gardening and practical work in the preparation, planting and care of garden plots. In the second-year course each student is given a definite garden project to work out, the study of the use and management of gardens is continued and garden competitions and judging take place.

CONFERENCES AND THEIR RESULTS

During the last week of July, 1915, a number of conferences were held with the school inspectors of the province for the purpose of discussing the organization and subsequent inspection of school-gardens and school-ground improvement. A half day was devoted to inspection and scoring of school-gardens in and around Victoria. In this way it was possible to adopt a standard to be followed in the inspection of school-gardens in future. Following these conferences a circular was sent to every teacher in the province, and to the secretary

of every school board, in which it was announced that special grants would be made for a variety of purposes connected with rural science, including grants to school boards conditional upon certain expenditures being made in the general improvement of school grounds; to school boards and teachers for organizing and maintaining supervised home gardens in cases where school gardens are not practicable and for school and home-gardening work when supplemented by occasional excursions for the purpose of studying improved methods in gardening, fruit and grain growing, dairying, live stock and poultry rais-

grants were also made for school ground improvement.

EXPRESSIONS OF APPRECIATION

Mr. Gibson received a number of letters testifying to the advance that was being made in rural science and in school gardening. A few sentences from these letters referring especially to the latter subject are herewith given:—

"The garden supplies us with specimens for drawing, painting, and for nature talks."

"Visits to a beautiful garden in the neighbourhood have been made at different seasons to see colour schemes and grouping"

"The trustees and parents of the



THE FIRST SCHOOL GARDEN AT KASLO, BRITISH COLUMBIA, MADE IN THE HEART OF A HEAVILY WOODED AREA

ing, etc. The distribution of this circular elicited a large number of inquiries and a number of applications for assistance in the starting of school gardens and in the improvement of school-grounds. About a hundred school boards were heard from in this connection. Many small gardens were established during the year and about sixty gardens became eligible to receive grants. Thirty

neighbourhood visit the garden. We have had a great number of plants offered to us, and also a great many demands for seeds that we collected and saved last year."

"A totally different spirit prevails in the class since this kind of work has been introduced. A new camaraderie, as it were, now exists; teacher and pupil are both deeply interested and both have much to learn. The children are extremely receptive and are ever probing for information. They are gaining knowledge by experience, and that is the knowledge which will remain."

PART IV

Special Contributions, Reports of Agricultural Organizations, Notes and Publications

AGRICULTURAL METEOROLOGY IN CANADA

BY R. W. MILLS, B.S.A., IN CHARGE OF AGRICULTURAL SECTION, METEOROLOGICAL OFFICE, TORONTO

IN the "Bulletin of Foreign Agricultural Intelligence" issued by the Department of Agriculture, Ottawa, there appeared an article in the May number, 1915, entitled "Weather Wisdom in Agriculture." This was of a nature to awaken interest in the matter of applying meteorological knowledge in agriculture.

The Meteorological Service of Canada has had since February, 1914, a department devoted solely to the investigation of agricultural meteorology. But before writing of the activities of this department, it seems advisable to quote the following from a recent article by Mr. R. F. Stupart, Director of the Meteorological Service:

"It is certain that under existing arrangements any farmer in the more thickly populated portions of the country may by noon obtain the weather forecasts for the coming night and following day, and a strong endeavour will be made early in the year to make it still more simple to obtain the weather bulletins.

"The channels through which the agriculturist may obtain a knowledge of the climate of his district are the Annual Climatological Report of the Service, the *Monthly Weather Review*, and the *Monthly Weather Map*. The first of these gives summaries of the monthly and annual mean values of every meteorological station, and tables of the monthly values of rain and snow. The *Monthly Review* gives mean values for the month, and a general summary of the weather conditions that have obtained. The *Map* which is published three days after the close of the month, shows the mean temperature in each of the provinces of the month just closed, the departures from average mean temperature, and the total precipitation, also in winter the depth of

snow lying on the ground on the last day of the month. In the text is given a general outline of the weather conditions and also a brief summary of crop reports obtained by telegraph through various agencies in the different provinces.

"In reference to agricultural meteorology proper, it is estimated by one thoroughly acquainted with cereals in Canada, that, in the province of Saskatchewan, under the best farming methods known to modern agriculturists, the yield of spring wheat varies from ten and twenty bushels per acre to fifty bushels per acre, according to the season,—unfavourable or favourable. Here is a possible loss of at least *thirty* bushels per acre of wheat, chargeable to the weather alone. Surely the great unsolved problem indicated in these figures, is a challenge to every effort on the part of scientific agricultural investigators."

The Experiment Station Record published by the United States Department of Agriculture, said editorially in June, 1913:—

"There is evidence that those who give thought to this subject are more clearly convinced than ever before of the need of experimental investigation into the specific effects of known and controlled conditions of moisture, temperature, sunshine, etc., on plant growth and healthy development.

"Prof. Cleveland Abbe has advocated the more exact study of the relation of meteorological and climatological conditions to plant growth by means of "climatological laboratories" in which the conditions are more or less completely controlled, thus supplementing and furnishing a check upon outdoor observations.

"The Russian Bureau of Agricultural Meteorology gives great prominence to problems of research and the direct correlation of meteorological factors and plant growth, without neglecting the popular and educational features of the work. It is probably the most completely organized attempt at exact and comprehensive investigation in this field now in existence.

"The service in Russia was organized in 1897. Its characteristic feature is a system of agricultural-meteorological stations scattered throughout the Empire, which, in addition to being equipped with the necessary meteorological instruments, are provided with experimental fields on which various crops are grown for the purpose of definitely studying the effect of the meteorological and climatological conditions on plant growth. This system of stations has accumulated a large amount of valuable data bearing upon the relation of meteorological factors to the soil and to the life and growth of cultivated plants, especially with reference to critical periods of the growth of various plants. Those experimented with have included, among others, corn, wheat, oats, rye, millet and buckwheat. Similar studies have been extended to the effect of the meteorological factors on the life and activities of domestic animals.

"There is a present need for more systematic research on a plan similar to that of the Russian Bureau of Agricultural Meteorology, and embodying certain of the features proposed by Professor Abbe."

Professor Broounoff, Chief of the Bureau of Agricultural Meteorology for Russia, in a pamphlet in French, styled "Some Considerations on the Organization of a Meteorological Service in the interests of Agriculture," wrote, with regard to the practical results of the studies at the agricultural meteorological stations, "Adaptation, be it only to the average weather,—the actual weather being impossible to foresee,—leads in many localities in Russia to an appreciable increase in yields. Another advantage of the knowledge of critical periods lies in the possibility of a judicious application of irrigation, which is extremely important in our arid regions, e.g. Turkestan and the south-east of Russia in Europe." (Translated).

It seemed to the writer that field work in agricultural meteorology, ought to be inaugurated in Canada, and when Dr. F. T. Shutt, Assistant Director of the Dominion Experimental Farms' System, was approached with a plan of co-operative work, in January, 1915, he replied by letter:—"At a general meeting of the chief officers and the superintendents of the

branch farms and stations I presented in outline the proposed plan for obtaining data for the closer study of the influence of weather on crops. You will be pleased to learn that they expressed themselves as impressed with the value that such investigations would in the long run be to the farmer and, further, that they would be willing, in so far as they were able, to co-operate in the work."

Translations were secured of some of the Russian forms used in field studies of spring grains. With the assistance of Dr. Shutt and of Dr. Chas. E. Saunders, Dominion Cerealists, I adapted the translated forms to methods possible this year in Canada, involving no additional outlay of money, and not an excessive demand on the time of the observers at the Experimental Stations. Each of 14 stations well distributed over Canada grew, during this season of 1915, a plot of Marquis spring wheat, and notes on the development of the crop were recorded on the forms supplied by the Meteorological Service. Questions called for a good deal of information, including (1) general field conditions and the farming methods employed, (2) dates of the important stages in the life of the wheat, from sowing to reaping, and the general condition of the plants at the time of the stages, (3) average height of plants on the plot every seven days, (4) the damaging effect of adverse weather phenomena on plants and soil, at any time throughout the season, losses due to meteorological and to other factors, and (5) final yield and quality. After threshing time, the completed forms are returned to the central office of the Meteorological Service, where the weather and crop data are to be correlated. By a graphical method the crop notes will be compared with charts showing the daily temperatures, precipitation and bright sunshine at each station, occurring throughout the season of the wheat.

Each station was visited during the growing season, and a first hand acquaintance obtained with the plots and the field conditions. Careful notes were taken. Uniform methods of taking meteorological observations were encouraged. Climatic conditions were investigated through observation and conversation with experienced men. The suitability was studied of most of our important crops to the climate of each Dominion Experimental Station. In short, much information was collected which will assist in an intelligent study of the crop and weather data.

The plans of the Department of Agricultural Meteorology include arrangements for the early translation of all Russian publications of value, and after these precedents have been thoroughly studied, the perfecting of field methods and equip-

ment, so that a serious attack may be made on these great problems.

As was pointed out at the beginning of this article the problems challenge scientific investigators all over the world. In a spirit of lethargy they may say, "The weather cannot be changed. What can we do about all this?" Or in

the indomitable spirit of modern science they may say, "Here is a great unsolved problem. We will never relinquish our efforts until a solution is found!"

It is in this spirit that Russia has attacked the question, and results indicate that her efforts have been worth while.

BANK ASSISTANCE TO AGRICULTURE

WHILE there is not as yet any organization in Canada exactly corresponding to the agricultural commission of the American Bankers' Association in the United States, there is a growing inclination on the part of the banks in this country not alone to pay heed to the financial needs of agriculture but also to actively aid in the advancement of the farming industry, thereby of course increasing values and improving the character of mortgages and guarantees. In the United States the activities of the banks in agricultural extension work find many outlets, apart from the operations of the strong and influential association of which mention is made, such as for instance free planting and tested seed competitions and boy and girl pig contests in Texas, dairying demonstrations and exhibitions in Iowa, helping young people to buy cattle in Kansas and pigs in Arkansas, distribution of literature in Alabama, the holding of farmers' picnics and lecture courses in Illinois, and the establishment of an agricultural library of two thousand volumes in Nebraska. These are but a few of the direct activities of banks in the various states having for their object the benefit of agriculture, but they are of a nature to indicate how widespread and varied the movement is.

In Canada similar progress is being made to that across the line, but it is confined almost entirely to the western provinces, and mainly through the cashing of notes approved and endorsed by organized co-operative associations, as is proven by the following facts compiled from information furnished by a bank manager of experience:

BOYS CATTLE FEEDING CONTEST

In 1914 the Western Sub-section of the Canadian Bankers' Association made a grant of \$1,000 to the Manitoba Winter Fair at Brandon to be distributed in 20 cash prizes, ranging from \$100 to \$5, to boys under 17 years of age exhibiting animals which had been fed and cared for exclusively by themselves for at least 6 months previous to the Exhibition of 1915. There were about 75 entries in the com-

petition. (See THE AGRICULTURAL GAZETTE, Vol. II, page 451.)

A grant of \$500 was made for 1915.

LIVE STOCK ASSOCIATIONS

On the strength of an undertaking by The Canadian Bank of Commerce to afford the necessary financial assistance, Live Stock Associations have been formed at North Battleford, Canora, Elfros and Lethbridge (vide THE AGRICULTURAL GAZETTE, Vol. I, page 1037, and Vol. II, page 188) to provide credit to farmers desirous of making a start in raising live stock. The movement is as yet in an experimental stage, but if the experiment should prove successful—as is practically assured—it will doubtless extend rapidly over the three provinces. It is certain that hitherto the development of the live stock industry in the west has been seriously retarded by a lack of capital.

SEED CORN

In the spring of 1915 a number of the chartered banks made a distribution of seed corn to a selected half dozen farmers at each of their branches throughout the three provinces, the total number of bags of seed distributed being about 2,500. Unfortunately 1915 was almost the only year in many years when weather conditions were highly unfavorable to such an experiment, unusual frosts in the latter part of June and the beginning of July having cut the plants down, so that they did not mature before the early autumnal frosts. Nevertheless, there were a good many districts in each of the three provinces in which the experiment was highly successful, and this distribution of seed will undoubtedly result in giving a marked acceleration to the extension of corn growing in the Canadian West.

AGRICULTURAL BULLETIN BOARDS

In December, 1914, an arrangement was entered into between the Bankers' Association and the Saskatchewan Department of Agriculture under which the banks placed a bulletin board in each banking office in the province, on which is posted from time to time the bulletins issued by

the Department. As a condition of the arrangement the Department undertook to issue its bulletins with sufficient regularity to keep the matter on the boards at all times fresh.

SASKATCHEWAN BOYS' AGRICULTURAL CAMP

A grant of \$250 has been made by the Western Sub-section of the Canadian Bankers' Association to the funds required to conduct an annual boys' camp at Regina under the auspices of the Extension Branch of the Department of Agriculture. (See THE AGRICULTURAL GAZETTE, Vol. II, page 786).

TESTING SEED GRAIN

It is the practice of some of the banks having a large number of western branches to make it a condition of granting credit to farmers that they shall have their seed grain tested at the beginning of each season. This requirement has each year resulted in saving from considerable loss a large number of farmers who were holding grain for seed which looked all right but which was in fact of low germinating power.

FORM OF APPLICATION

Following is a sample of the form of application for shares, which mean credit, used by all co-operative companies of Saskatchewan. It will be noticed that it is addressed to the Canora Live Stock Company, Limited, of which mention is made in the foregoing, and is confined to farm animals:

To the Canora Live Stock Company,
Canora, Sask. Limited,

Sirs,—

I, _____ of _____ Section _____ Tp. _____ Range _____ West 2nd, hereby make application to you for _____ head of _____ weight _____ age _____ sex _____ preferable of the _____ breed. If pure animals cannot be obtained I will (or will not) take grades of the same breed; same to be delivered to me at Canora, Sask., on or about _____ 191 _____ and I hereby agree to purchase from you the said _____ or such less number as you may deliver to me at a price fixed by you, not to exceed \$ _____ per head, and to pay for the same in cash, or notes at _____ months, bearing interest at the rate of 8 per cent per annum; the Company taking a Chattel Mortgage on the said stock, the said mortgage to be cancelled upon the notes being redeemed.

I hereby agree not to sell or dispose of the stock purchased until it is paid for, and to furnish the Company with a monthly statement regarding the condition of the stock. The increase of the stock I agree not to sell

CONSERVATION OF MOISTURE

As a consequence of the serious crop failure from drought over large areas of Southern Saskatchewan and Alberta in 1914, the banks joined with the Saskatchewan Department of Agriculture in a campaign to induce the farmers to cultivate their fields in 1915 so as to conserve the moisture. In this connection a leaflet of directions, consisting of 7 or 8 paragraphs under terse headings, was placed by the banks in the hands of over 96,000 farmers in the three provinces. It is now quite clear that the distribution of this leaflet was one of the important factors in connection with the bulletins issued by the various governments, that resulted in the great improvement which was this year manifest everywhere in the preparation of the seed bed.

SEAGER WHEELER ON SOIL TILLAGE

An article by Seager Wheeler (whose prize takings in several international grain competitions have made him famous) was issued in pamphlet form and 30 to 40,000 copies distributed to the farmer customers of certain of the banks.

or dispose of until such time as the original animals are paid for in full.

I own _____ acres, and farm _____ acres. I have _____ acres under cultivation and _____ acres suitable for pasture.

My buildings are as follows:

My farm is registered in the name of _____ and is encumbered to the extent of \$ _____

I have now the following stock: encumbered to the amount of \$ _____

I have the following water supply:

I have the following amount of feed on hand at my farm at the present time,

I shall need additional feed as follows: which I will purchase from _____

My entire liabilities are as follows:

I hereby apply for _____ Shares in The Canora Live Stock Company, Limited, and to pay Five per cent on receipt of the stock.

Dated at Canora, Sask.; this _____ day of _____ 191 _____

(Signature of Applicant.)

(Post Office Address.)

In the presence of _____

Witness.

A COUNTY IMPROVEMENT LEAGUE

TO revive the business life in Hampden County, Massachusetts, a County Improvement League has been organized with these purposes: 1. To help the farmers introduce the most modern methods of farming. 2. To organize them for the purpose of better business methods and business organization. 3. To improve the living conditions and make the open country so attractive that neither the farmers nor their boys and girls would be attracted to the cities. The organization and work of the League are described in *The Banker Farmer*.

The League enlisted more than 1,000 farmers and business men who are giving financial and zealous support. The county appropriates \$10,000 a year toward the expenses of the League. It has been in existence for two years and has yielded returns, both in increased crops and better farming and in a new spirit in the rural communities.

The League employs trained men in agriculture and horticulture, and poultry-raising, and adviser for the boys and girls, an editor of a weekly newspaper, *The County League Advisers*, a "Home-Making Adviser," a woman whose object is to help the women of the farm, and a general secretary.

At first the farmers were somewhat slow to take to the ideas, but now the demands of the farmers are so great that it is utterly beyond the power of the League to meet them even with its enlarged force.

New crops have been introduced, such as alfalfa and soy beans. The League had last year 15 demonstration plots in alfalfa, all of which were very successful. Silos are being built in many parts of the county.

The horticultural adviser is meeting with a large response to his efforts. The acreage of berries in this county has actually been doubled as a result of his efforts. Thousands of trees in every part of the county that were neglected before are being sprayed, pruned and fertilized. All over the country new orchards are being planned.

The poultry adviser, after a thorough survey of the county, feels that the egg output of the county can easily be doubled without adding to the number of hens. He has started a campaign to develop this industry by introducing better stock, adopting better methods of taking care of poultry, better feeding, housing, etc. The League is helping the farmers to introduce modern business methods upon their

farms. A system of bookkeeping is being introduced as a means of helping the farmers find out where their losing operations are and assisting them in introducing efficient business methods in their farming operations.

Farmers are being organized to improve their marketing methods. The League is helping the farmers to standardize their products and instructing them as to the proper methods of handling and picking. Farmers' Credit Exchanges are being organized. A group of farmers sign an agreement, forming a "Farmers' Credit Exchange," each member having the unanimous endorsement of the other members. A committee of three is elected to approve applications for loans to members only, with power to sign the same if favourable, security offered being in the form of mortgages, either chattle or otherwise. The borrower presents an endorsed note to any bank. The bank has as its guarantee the unlimited liability of every member of the Exchange.

The League has organized the Hampden County "Volunteers." This includes the boys and girls who enter all or any of the departments of the Volunteers. These departments include club work, such as agriculture, horticulture and home economics; play and recreation work, and literary work where the youthful members must read at least four books, one on country life, one on play and recreation, one on better living, and a story book.

The League has enlisted eighty women's organizations within the county and these have created what is known as the Home Committee. This brought together the women of the farms and the women of the cities in a joint effort to raise funds to secure a home-making adviser and establish a system of district nursing throughout the county. Enough money was raised by the women and the League employed a woman worker.

It is hard to over-emphasize the new county solidarity, which means even more than the economic gain. This was expressed by one farmer who was addressing a group of 200 business men. He said, "It means much to me to be able to make \$2 or \$3 where I have made \$1 before. It means much to my wife and to my children, but it means more to have you men come into the country as you did, and to invite me to come here, as you did. It is obliterating the line of demarcation between the farmer and the business man and is bringing us together shoulder to shoulder."

THE NATIONAL ASSOCIATION OF AUDUBON SOCIETIES

A BRIEF SKETCH OF ITS ORIGIN, PROGRESS, AND ACCOMPLISHMENTS

BY ERNEST INGERSOLL, CHIEF CLERK

IN 1886 Dr. George Bird Grinnell, Editor of *Forest and Stream*, of New York, coined the term "Audubon Society," and under this title began an organization for the protection of birds which flourished for a time and then expired. Seed remained, however, and in 1895 Audubon Societies began to be organized in various States of the Union and in Canada.

No close affiliation existed between these different organizations for a time, and the conditions of membership varied widely. The need of some centralized influence, to bind more closely these widely scattered efforts, resulted in the formation of a National Committee under the influence of the American Ornithologists' Union. Under the leadership of William Dutcher this Committee did much service from 1902 to 1905 in obtaining legislation for the protection of non-game birds, and in employing wardens to guard breeding colonies of seabirds, principally along the coasts of Maine, Massachusetts, and New Jersey.

The efforts and accomplishments of this committee grew rapidly, and led to the organization, in January, 1905, of the *National Association of Audubon Societies for the Protection of Wild Birds and Animals*. William Dutcher was chosen President, and T. Gilbert Pearson was made Secretary and Financial Agent. Mr. Pearson had shown special qualifications as an organizer and public speaker, and was employed to give half of his time to this work, his salary and expenses being provided by Albert Willcox from January, 1905, until his death.

By the death of Mr. Willcox, in the summer of 1906, the Association received a bequest of \$331,072, so that, with other resources, the Association had, at the end of 1906, an interest-bearing endowment-fund of more than \$336,000, and an income from other sources approaching \$9,000. This was doing well for an incorporation only two years old. Only twelve States were then without Audubon Societies, and thirty-five States had adopted the Audubon Model Law protecting non-game birds.

The next four years witnessed a rapidly increasing growth in public interest in its objects, especially in its efforts to restrain the use of feathers in millinery. Its first decisive success was achieved in May, 1901, when, after a stupendous campaign, the Audubon bill to prohibit the sale of the feathers of native birds in the state of New York was enacted. A similar law has since been enacted in about a dozen other States. The Association through its various agents

keeps in close touch with State legislation generally, and many laws for the establishment of game-commissions, game-warden forces, prohibition of the sale of game, etc., owe their existence to Audubon Society activities, directed, and often financed, by the Association.

On October 19, 1910, William Dutcher, was stricken with paralysis, and since that time has not been able to take even the slightest part in the work, which has since been carried vigorously onward by the Secretary, Mr. Pearson.

The educational side of Audubon work has been prominent from the beginning. In 1910 Mr. Pearson devised a plan for enrolling school-children as Junior Audubon members. Each child was asked to pay a fee of ten cents, but received in return material which cost much more than this to publish. The teacher organizing a class of ten or more was to receive a free subscription to the magazine *Bird-Lore*, edited by Dr. Frank M. Chapman, and pictures and printed aids to instruction in building bird-boxes, supplying food for birds in winter, and on similar topics. This plan has been in successful operation for several years, and by the liberality of its supporters the Association has been able to expand its junior work greatly, so that up to July 1, 1915, it had enrolled and given systematic instruction in bird-study to 373,153 children and 18,966 teachers.

Among other phases of the Association's educational work may be mentioned the publication of a richly illustrated book on the birds of Alaska, distributed gratuitously to the 8,000 school-children of that territory. This was sent to them as a Christmas present in December, 1914.

Hundreds of articles bearing on the economic value of birds to mankind, and the pleasure and profit to be derived from their study, have been published in school-journals, in various literary magazines, and in newspapers throughout the country.

A force of six or seven lecturers is maintained, who give illustrated addresses before audiences of school-children, and to women's clubs, granges, and other organizations. A system of courses in bird-study was given by the Association's special corps of lecturers at many different State summer schools for teachers last summer.

In 1914 the Association began its Department of Applied Ornithology, with Herbert K. Job in charge. This is a special work to encourage the people generally to attract birds about their homes by artificial

means, and to induce those favorably situated to engage in the propagation of wild ducks and other game-birds. Bulletins and lectures bearing on this point are destined to produce a decided influence on popular sentiment.

The National Association of Audubon Societies is to-day a strong, far-reaching institution. Its platform is wide. While engaging actively in preserving wild life, it recognizes fully the claims of the sportsman, and has no fight with the man who legally kills game-birds and game-animals. In summer it guards, by means of paid wardens, virtually every important colony of sea-birds on our Atlantic and Gulf coasts, as well as on many lakes of the interior. It owns or leases many islands where ducks and sea-birds breed, and these places are wonderful bird-sanctuaries. It originated the system of Federal bird-reservations

and co-operates financially with the Government in protecting them. It publishes and distributes annually over 6,000,000 pages of bird-protective literature, and the home office, where twenty clerks are engaged, has become a general clearing-house for all kinds of information in reference to the study and conservation of wild birds and animals. It is pleased to correspond with any inquirer.

Any one sympathizing with its aims may become a member of the Association at a cost of five dollars a year, for which he receives *Bird-Lore* and other publications as issued. The total membership is now about 3500, and the expenditures of the Association this year will amount to nearly \$100,000. It is doing a great work in the protection of wild life all over the continent and merits all possible encouragement.

THE MARKETING OF FARM PRODUCTS

BY CHARLES J. BRAND, AT THE UNITED STATES NATIONAL CONFERENCE ON
MARKETING AND FARM CREDITS

IN marketing and distributing farm products two great purposes can be served by a thorough-going system of grades and standards. These are the furnishing of an accurate basis for price quotation, and, related thereto, the furnishing of an adequate means for the dissemination of market information.

We can never have much progress until the buyer and the seller are discussing the commodity in the same terms, and that means that we must have grades and standards not only as to quality, but as to packages and containers. I think it is true that the greater the accuracy of the standards by which products are sold, the less the margin between the price received by the producer, and that paid by the consumer in the case of non-manufactured products, or by the manufacturer in the case of products which must be worked into consuming condition.

One of the investigators of the office of markets and rural organization found on the Chicago market, based upon observations made between September 15th and December 5, that approximately 25 per cent of the carload bulk arrivals of apples amounting to about 350 carloads, and about 10 per cent of the barrel shipments, equal to 160 carloads, were so low in grade and quality that they would not have reimbursed the freight charges had this kind of fruit been received in straight carload quantities.

STANDARDIZATION OF PACKAGES

Not the least important of the ques-

tions of standardization are those that relate to the packages themselves in which commodities are transported or sold. In order to get an accurate idea of the diversity which prevails in this regard, Mr. C. T. Moore, who is in immediate charge of the work in grades and standards for fruits and vegetables, has made a collection showing the size and types of packages and containers current in the trade. I assure you it is a motley horde, and is, in itself, a complete argument for standardization. No consumer could ever hope to know what he is getting in quantity in buying grapes. New York has one set of grape baskets, Michigan another, and still other grape territories, other kinds. Some of them look very much like others, but contain less. Such confusion furnishes endless opportunity for manipulations, and even dishonesty. In the case of strawberry boxes, not only is there exceedingly great variation in the cubic contents, but it is a common practice to repack from containers of greater capacity to those of less in distributing in and to the retail trade. Likewise with peaches. The successful commercial orchardist packs his peaches in the 2-1, 2-2 and 3-2 packs, according to the size of the fruit, particularly in the popular and generally-used Georgia carrier baskets, and often when he buys his own fruit he finds that where he had packed as high as 36 to 45 in each of the four-quart baskets, the retailer has repacked them so that he will buy from 19 to 25 peaches in the same basket.

COMMENDS ITSELF TO LEGISLATION

Standardization of containers is a proper subject for federal legislation under the weights and measures power of the constitution. Congress has recently used this power in establishing the standard barrel for apples, cranberries and certain other fruits. By virtue of this legislation the containers covered by what is commonly known as the Tuttle bill became standards of measure with the same force and legal effect as the bushel. This act becomes effective July 1, 1916, and applies to intrastate as well as interstate commerce. Undoubtedly this barrel will replace a large number of short measure packages, which are used for potatoes, truck crops, fruit and other things, and which vary in capacity from two bushels up to ten or twelve pecks. The standardization of apple boxes, berry crates and cups, and other containers, is under consideration, and we may look forward to progress with reference to these.

In some cases, even in the same State, there are dual standards applicable to the same products. In New York are two sets of standard grape baskets. Legislation has been placed on the books in a number of states, and is under consideration in others, particularly New York, Maine, Massachusetts, Connecticut, Vermont, and some of the western states, which will tend to uniform trading in numerous products.

The opportunities for standardization of grades and their application to products is greatest under conditions of organized production. Reciprocally, likewise, the possession of standards and grades yields through better market returns the best dividends upon organization. The department of agriculture is working earnestly upon many of the problems related to grades and standards, and will welcome suggestions and assistance from producers, shippers and others that will lead to further improvement along these lines.

HOW SHOULD SCIENCE BE TAUGHT

IN a recent number of the journal *Nature*, published in London, England, there appears a criticism containing a number of very rational ideas with respect to the imparting of instruction in the modern college. The criticism is offered that too often pupils are taught as though they were being trained for service in the laboratory or other research work, rather than in the field of practical experience. The writer says:—

"It may be doubted whether the methods now followed in the teaching of scientific subjects in schools are as effective in creating or fostering interest in science as those formerly adopted. Twenty years ago or so, much more attention was given to the attractive side of science than is now the case. Pupils were shown interesting experiments or were encouraged to read about remarkable facts and phenomena in nature; and if they took a practical course they were able to cover a fairly wide field. In physics, for example, a student could learn something about the whole elementary range—mechanics, heat, sound, light, electricity, and magnetism, in chemistry he would see many striking changes and effects, such as impress themselves upon the youthful mind; in natural science he would be told many wonderful facts about birds and beasts and other objects—animate and inanimate—in the world of nature.

"No comprehensive survey of this kind is possible under existing conditions of science-teaching in schools. In physics

few students get beyond a course of work in mechanics and heat, and they leave school without receiving any instruction in other branches of the subject; their practical chemistry is frequently limited to manipulations and a study of air and water; and work in nature-study means mainly the observation of a few facts of plant-physiology or of animal development and habits.

"The practical work now done is certainly more valuable as a means of scientific training than it used to be, but it may be doubted whether by such exercises science can claim a prominent place in the curriculum. Modern life requires that the elements of scientific method and knowledge should form part of every educational course. School-work should not be concerned in training experts in science, any more than specialists in classics, but with imparting the rudiments of a liberal education to all pupils so as to awaken interest which will continue when school-days are over.

"In their anxiety to impress pupils with a sense of scientific accuracy and cautious conclusion, advocates of the methods now in vogue have forgotten that it is even more important to present a view of science which shall be human as well as precise. To the general neglect of this aspect of scientific study, which appeals to all, must be ascribed the fact that science has lost much of its former popularity, and has become a task in which only a favoured few can hope to excel."

WHY EXPERTS LEAVE US

IS it a sound economic policy to educate these young men at the expense of the taxpayers of Oklahoma and then allow them to go to Minnesota, Wisconsin, Iowa, Illinois and other states that know the value of their kind of education for the purpose of teaching to their boys and girls the value of diversification?

Well, you say, how can we keep them home? The answer comes back—agitate until our people are willing to pay the price that will keep these young men here. The people will never be willing to do this until we as school men can show the value and need of such.

We as school men must be willing to admit that many of the things we have been teaching have not been practical and useful. Then we must decide that some other subjects such as crops, soils and animal study are not only useful but just as intellectual as the "so-called cultural subjects."

Is it not just as useful to a boy to know the possibilities of a handful of soil as to

know all about partial payments? Is it not as practicable for a boy or girl to know the difference in the growth of corn and alfalfa roots as to know all about cube root? Schools with home gardens are found in almost every portion of the State.

About 65 years ago Denmark was suffering from a lack of the necessities of life. Most of her land was in the hands of a few; her people were ignorant and restless and were of sheer necessity clamoring for a change. They made the change; they taught the boys and girls in terms of their life's work; they taught the practical things of life.

Today Denmark is prosperous. Her people are satisfied and ambitious; they are advancing as no other people are. No other nation has such a small per cent of illiteracy. A large per cent of her land is in the hands of a majority of her people. A great number of her people take advantage of her higher institution of learning. —*The Oklahoma Farmer*, December 10, 1915.

RURAL SCHOOL REFORM

"The old-fashioned, one-room school-house which holds forty or fifty ungraded pupils, having but a single teacher who knows nothing but books, is not a modern institution, though great men have issued from its door.

"How can the schools of a county be so co-ordinated and combined as to make them efficient tools? What should be the standard for a teacher's qualifications? How many children can be brought to and taken from the school to distant homes at the least expense? To what extent should the teaching be out of doors and the examples those of real life? How can the boy learn that there is adventure in farm life as well as in the city? —for adventure he will have. To what uses may the school building be put as a community centre for the neighbourhood dance, lecture, or moving-picture show, or, perhaps, as the

home of a co-operative buying or marketing organization? These are but a few of the questions which many men have tried to answer, and there have been some successful experiments made and right answers given."

Secretary Lane, of the United States Department of the Interior, after asking the above questions in his annual report states:

"The quickest and surest way to set this country aflame with zeal for a better type of country school would be to show the teachers such schools, make them live in them and learn from them by seeing them in action."

This, he claims, might be carried out by taking ten live men or women from each State for a month's study of the most modern rural schools.

RUSSIAN GOVERNMENT AGRICULTURAL AGENCY

Russia maintains in America an office known as the Russian Government Agricultural Agency, located at 2351 South 39th Street, St. Louis, Missouri. Mr. W. P. Anderson is the Commissioner and Mr. Wencelas P. Kotchetkow is Assistant Commissioner. The latter was for some years a district representative in Russia, and taught for a time in the Agricultural Institute at Moscow. He has recently paid a visit to Ontario to study the methods

of agricultural instruction. It is interesting to note that Russia has for some time carried on an extensive agricultural instruction work quite similar to that which has been so successful in Ontario. Russia has solved some rural problems that we are now investigating in Canada. An interesting and comprehensive article on Russia may be found on page 25 of *The Agricultural War Book of 1915* published by the Dominion Department of Agriculture.

STALLION ENROLMENT IN 1915

FOLLOWING are returns received of stallion enrolment during the past year in the provinces of Ontario, Manitoba, Saskatchewan and Alberta:-

Breed	Ont.	Man.	Sask.	Alt.
Clydesdale..	1,326	478	345	98
Percheron	328	160	127	74
Shire..	70	20	7	17
Suffolk		5	10	1
Belgian..	21		27	4
Draught ..		28		
French-Canadian	2			
Standard-bred	255	44	43	11
Thoroughbred..	46	13	5	2
Hackney	77	20	7	1
Coach..		5		
French Coach.	9		1	

German Coach.	6	..	..	..
Kentucky				
Saddle .....	..	..	2	..
Any other				
Breed..	7	..	1	..
Total				
Pure Breds..	2,147	773	575	208
Grades..	1,018	161	553	198
Scrubs	..	..	532	..

In 1914 the total enrolment of pure-breds, as given on page 187 of the February number of THE AGRICULTURAL GAZETTE, in these four provinces was: Ontario 2,083; Manitoba 796; Saskatchewan 629; Alberta 231. The grades enrolled were: Ontario 1,118; Manitoba 175; Saskatchewan 132; Alberta 186. The scrubs recorded in Saskatchewan numbered 113.

SOCIETIES AND ASSOCIATIONS

ANNUAL MEETINGS AND CONVENTIONS

The Alberta Veterinary Association, Edmonton, Alta.; Secretary, F. A. McCord; Edmonton, Alta.; July 10, 1916.

Prince Edward Island Dairy Association, Charlottetown; Secretary, C. E. MacKenzie, Milton, P.E.I.; February 23rd, 1916.

The Manitoba Dairy Association, Manitoba Agricultural College, Winnipeg, Man.; Secretary, L. A. Gibson, 301 Beverley St., Winnipeg; Wednesday and Thursday, February 16th and 17th, 1916.

United Farmers' Co-operative Co., Limited, Toronto, Ontario, Secretary, J. J. Morrison, Toronto, Ontario. February 2nd and 3rd, 1916.

The Manitoba Winter Fair and Fat Stock Show, Brandon, Manitoba; Secretary, W. I. Smale, Brandon; March 8th and 9th, 1916.

The Saskatoon Winter Fair, Saskatoon, Saskatchewan; Secretary, P. F. Bredt, Regina, Saskatchewan; March 21st to 24th 1916.

The Saskatchewan Provincial Winter Fair, Regina, Saskatchewan; Secretary, D. T. Elderkin, Regina, Saskatchewan; March 14th to 17th, 1916.

The Ontario Corn Growers' Exhibition, Curling Rink, Chatham, Ontario; Secretary, J. W. Noble, Essex, Ontario; February 1st, 2nd, 3rd and 4th, 1916.

The General Stock Breeders' Association of the Province of Quebec, Queen's Hotel, Montreal, Quebec; Secretary, J. A. Couture, Quebec, Que.; February 8th, 1916.

The Brandon Poultry Association, Brandon, Manitoba; Secretary, E. H. Hebel, Brandon, Manitoba; February 7th to 11th, 1916.

Manitoba Beekeepers' Association, Horticulture and Biology Building, Manitoba Agricultural College, Secretary, S. A. Bedford, Department of Agriculture, Winnipeg; Tuesday and Wednesday, February 15th and 16th, 1916.

THE CENTRAL CANADA VETERINARY ASSOCIATION

The thirteenth annual meeting of the Central Canada Veterinary Medical Association was held in Ottawa on January 19th and 20th.

The officers for the ensuing year are as follows:—Hon. president, Dr. F. Torrance; president, Dr. Geo. Hilton, Health of

Animals Branch, Ottawa; vice-president, Dr. R. T. O'Hara; secretary-treasurer, Dr. H. D. Sparks, 338 Slater Street, Ottawa; executive committee, Drs. Hollingsworth, Higgins, Barnes, James, Young, McGuire and O'Hara.

THE CANADIAN FORESTRY ASSOCIATION

At the annual meeting of the Canadian Forestry Association held in Ottawa on January 19th and 20th, the following officers were elected:—President, Lt.-Col. J. B. Millar, Toronto; vice-president, Hon. Sydney Fisher, Ottawa; secretary, Robson Black, Ottawa; territorial vice-presidents, Ontario, Hon. G. H. Ferguson; Quebec,

Hon. Jules Allard; New Brunswick, Hon. George J. Clark; Nova Scotia, Hon. O. T. Daniels; Manitoba, Hon. T. C. Norris; Prince Edward Island, Hon. J. A. Matheson; Saskatchewan, Hon. Walter Scott; Alberta, Hon. A. L. Sifton; British Columbia, Hon. W. R. Ross.

THE PRINCE EDWARD ISLAND CENTRAL FARMERS' INSTITUTE

The annual meeting of the Central Farmers' Institute was held in Charlottetown on Tuesday and Wednesday, January the 18th and 19th.

There were present delegates from thirty-one local institutes in the province as well as delegates from the Poultrymen's Association, Dairymen's Association, and Fruit Growers' Association.

The following resolutions were adopted:

RESOLVED: that the Central Farmers' Institute approves of the Government giving financial aid to farmers for the purpose of underdraining their land, and this Association would suggest that the method adopted be similar to that which has worked satisfactorily in the provinces of Ontario and Nova Scotia.

RESOLVED: that the Central Farmers' Institute does most heartily commend the Agricultural Instruction work, now being carried on in this province under THE AGRICULTURAL INSTRUCTION ACT for the extension of agricultural education, special mention being made of the following: The short courses of agriculture and domestic science, the establishment and assistance given to Women's Institutes; the establishment of a chair of Rural Science in Prince of Wales College, and the introduction of this subject into the common schools; the assistance given whereby co-

operative wool grading has been established; and we would suggest that the Government supplement the above in order that similar work could be done along other lines of agriculture, drainage and feeding demonstrations.

RESOLVED: that the Central Farmers' Institute approves of the idea suggested by Rev. Dr. Gauthier at the Amherst Winter Fair that the Nova Scotia College of Agriculture be made the Maritime College of Agriculture.

RESOLVED: that the Central Farmers' Institute desires to put on record their confidence in the Prince Edward Island Egg and Poultry Association, and their intention to support in every way possible the work undertaken by the above mentioned association.

RESOLVED: that whereas the roadsides in many districts are allowed to grow all kinds of weeds, the Central Farmers' Institute ask the Provincial Government to have the Weed Act strictly enforced.

RESOLVED: that the new standard weights and measures be put into effect.

The following officers were elected:—D. N. McKay, president; Robert Agnew, vice-president; E. B. McLaren, secretary; Rev. P. C. Gauthier and W. H. McGregor.

NOVA SCOTIA FRUIT GROWERS

At the fifty-second annual convention of the Nova Scotia Fruit Growers' Association held at Wolfville on January 18th, 19th and 20th, resolutions were passed urging the Economic and Development Commission to consider the situation as regards fertilizers and requesting the provincial government to appoint an inspector of apiaries with a view of checking the ravages caused by foul brood. The

following officers were elected—President, F. A. Chipman, Nicteau; vice-president, Prof. W. S. Blair, Kentville; secretary, Manning K. Ellis, Port Williams; assistant secretary, F. W. Foster, Kingston; treasurer, Geo. W. Munro, Wolfville; executive A. S. Banks, Berwick; S. C. Parker, Berwick; Fred. Johnson, Bridgetown; J. Elliot Smith, Wolfville.

THE QUEBEC BEEKEEPERS' ASSOCIATION

At the annual meeting of the Quebec Beekeepers' Association held in November, 1915, the following officers were elected: President, Dr. Emery Lalonde, Rigaud;

vice-president, A. L. Beaudin, St. Chrysostome; secretary, Oscar Comire, Abenakis Springs.

THE ONTARIO AGRICULTURAL AND EXPERIMENTAL UNION

The 37th annual meeting of the Ontario Agricultural and Experimental Union was held at the Ontario Agricultural College on January 10th, 11th and 12th.

During the three days that the meeting lasted a number of exceptionally practical addresses were delivered, founded on actual experiments and research. The morning of the opening day was taken up largely with the president's address and discussion to which it gave rise. Professor Zavitz, of the Ontario Agricultural College, presented a comprehensive report on Co-operative Experiments in Agriculture for 1915, including tests of cereals, potatoes, roots, fodder, crops, etc., and Professor J. E. Howitt of the College, delivered an instructive address on "The Potato Rot, as Affecting Seed Potatoes." Professor Howitt, in the course of his address, said that the average yield per acre of potatoes in Ontario for the last 34 years was 116 bushels, but that in 1915 it was only 76 bushels. The crop last year was over 5,000,000 bushels below the average. The chief cause of this was an epidemic throughout Western Ontario of the fungous disease known as Late Blight and Rot, which probably involved a loss of \$1,200,000, that is 3,000,000 bushels at 40 cents per bushel. The Professor emphasized the importance of choosing varieties, as far as possible that were immune from this disease and the thorough spraying of the growing crop, using the Bordeaux mixture, (4-4-40 formula). The varieties that had been found freest from Rot were Davies' Warrior, Extra Early Eureka, Stray Beauty and Holborn's Abundance. Those most subject to it were Early Rose and Beauty of Hebron. In a subsequent address Professor Howitt dealt with weed eradication, giving the results of various

experiments conducted during the past four years, from which the conclusions arrived at were as follows:—

1. That good cultivation, followed by rape sown in drills, provides a means of eradicating both Perennial Sow Thistle and Twitch Grass.

2. That rape is a more satisfactory crop to use in the destruction of Twitch Grass than buckwheat.

3. That rape gives much better results in the eradication of Twitch Grass and Perennial Sow Thistle when sown in drills and cultivated than it does when sown broadcast.

4. That thorough, deep cultivation, in fall and spring, followed by a well cared for hoed crop, will destroy Bladder Campion.

5. That Mustard may be prevented from seeding in oats, wheat and barley by spraying with a twenty per cent solution of iron sulphate without any serious injury to the standing crop or to the fresh seedings of clover.

Professor Zavitz led a discussion on sweet clover and Mr. J. E. McLarty, of the College, presented a report on Elementary Agriculture, Horticulture and Forestry in Rural Schools prepared by Professor S. B. McCready, who was unable to be present. The discussion that followed was led by Dr. Dandeno, Professor McCready's successor in the inspectorship of Elementary Education for Ontario. Mr. Morley Pettit, Provincial Apiarist presented the results of co-operative experiments in Apiculture. Mr. P. E. Angle, B.S.A., manager of a 1,000-acre farm at Simcoe, Ontario, dealt lucidly with Business Methods and Farm Accounts, showing how by the adoption of business methods and

labour-saving devices much valuable time could be saved and efficiency increased. Mr. Angle also demonstrated his method of keeping accounts, not only in so far as the business of the farm was concerned, but also labour, both man and horse, which is a feature to be considered in cost of production. In the evening of the first day addresses were given by Mr. C. F. Bailey, Assistant Deputy Minister of Agriculture for Ontario, and the Hon. F. G. Macdormid Acting Minister of Agriculture during Hon. Jas. S. Duff's absence owing to sickness.

In the forenoon of the second day after the reports had been presented of the treasurer and auditor, which showed a balance of \$1,500 on hand, and of the committee on the Weed Act of Ontario, Mr. George H. Clark, Dominion Seed Commissioner, presented the report of the committee on the "Prevention of the Importation and the Distribution of Noxious Weed Seeds in Grains and in Screenings." This report went very fully into the matter with which it dealt, pointing out that it was not to the advantage of the grain grower whose land is foul with weed seeds to clean his oats or barley before sending it to market, while the Western grain grower continued to ship weed seeds in feed grain to the Ontario feeder. It was important, said the report, that the Ontario feeders should clearly understand the actual value for feeding of the recleaned grain as compared with the lower grades that are polluted with weed seeds of all kinds. The following discussion led to the adoption of this resolution:—

"That the Experimental Union memorialize the Hon. Jas. Duff, Minister of Agriculture in Ontario, to consider the advisability of amending the Noxious Weed Act, or other law, to declare unlawful the sale and distribution of feed grain or screenings in Ontario containing more than two per cent of weed seeds that would pass through a one-fourteenth inch perforated zinc screen.

Professor G. E. Day described the result of experiments that are still being carried on to find the value between mature and immature corn for silage. In the absence

of W. J. Lennox, of Toronto, Dominion Seed Commissioner Clark dealt with "Ontario's Supply of Good Seed for 1916." He predicted that there will be no shortage in spring wheat, oats or barley, but rape, vetch, beans, peas and alfalfa will be scarce. Red Clover seed is very scarce and the price will be unusually high. The supply of alsike will be very fair. Timothy seed in quantity and quality is uncertain. Best quality seed corn promises to be scarce. There will be plenty of mangel seed, but Swede turnips will not be plentiful. There will be a shortage also of some garden vegetables. Professor Zavitz outlined the results of fertilizer tests, and distributed pamphlets giving complete results. The Dominion Horticulturist, Mr. W. T. Macoun, gave an address on the "Important Factors in Connection with Fruit Growing in Ontario." He thought there was no danger of over-production of the right sort and that the diversified fruit-grower had the best chance of success. Mr. P. W. Hodgetts, of Toronto, and Professor Crow, of the O. A. C., took part in the subsequent discussion, the latter going analytically into the cost of handling and shipping and expressing the opinion that the expense involved was much too high. A paper by Mr. F. M. Clement, of Jordan Harbour, urged the use of more uniform packages, and more uniform packs. He was also an advocate of advertising.

Mr. W. Bert Roadhouse, Deputy Minister of Agriculture for Ontario, reviewed the progress that had been made in agricultural education in the public schools, placing particular stress upon the value of school gardening, school fairs, and boys' and girls' competitions.

The election of officers elected were as follows:—President, J. B. Fairbairn, Beamsville; vice-president, Harry Sirett, Brighton; secretary, Prof. C. A. Zavitz; assistant secretary, Prof. W. J. Squirrell; treasurer, A. W. Mason; directors, Dr. G. C. Creelman, Guelph; Hon. Nelson Monteith, Stratford; H. A. Dorrance, Orangeville; Harvey Webster, Science Hill; J. C. Neale, O. A. C.; auditors, S. H. Gandier and R. R. Graham.

THE EASTERN ONTARIO DAIRYMEN'S ASSOCIATION

The thirty-ninth annual convention of the Eastern Ontario Dairymen's Association was held at Renfrew on January 5th and 6th. President J. A. Sanderson, Oxford Station, in his opening address referred to the decrease there had been in butter-making in 1915, which, however, he said, had been offset by an increase in price. The production of cheese showed an increase that, with the higher price obtained, meant a total increase in value for the six months from May 1st to

November 1st of \$6,250,000, compared with 1914.

The Dairy Instructor for Eastern Ontario in his report stated that during 1915, 847 cheese factories were in operation in his section of the province, and that the sum of \$66,000 had been expended by 479 owners for upkeep and improvement of factory and equipment. From May 1st to November 1st a total of 927,000,000 pounds of milk had been delivered to these factories and 85,000,000 pounds of cheese

had been manufactured, an increase of 8,000,000 pounds over 1914. Owing to the fact that the cheese season lasted longer than usual last year, the total output for the season would probably exceed that of 1914 by 15 per cent. The high price of cheese had brought many patrons back to the factories so that the total number of patrons of Eastern Ontario cheese factories was 29,607 for 1915, an increase of 1,100.

Mr. Publow further stated that during last season 38 creameries were in operation in Eastern Ontario, and that new ones had been established at Napanee, Cornwall and Arran. Of these 28 were equipped with good storage facilities; 12 collected the cream three times a week and 26 twice a week. Sixteen are using scales for weighing the samples for testing with Babcock test. From May 1st to October 1st, 2,800,000 pounds of butter were produced, a falling off in the total make of 200,000 pounds compared with 1914. Whey butter to the amount of 381,000 pounds had been manufactured in cheese factories. Some 4,835 patrons supplied the cream to the regular creameries during the season, about 100 fewer than in 1914.

Mr. Henry Glendinning of Manilla, dealt with the care and management of the dairy cow, and in doing so placed special emphasis upon the importance of silage and alfalfa. The Director of Experimental Farms, Mr. J. H. Grisdale, in an instructive address urged farmers to do their utmost in production. There were four paramount crops in Eastern Ontario, namely, corn, clover, oats and grass. In 35 years he had not known a single failure with corn in the Ottawa Valley. He followed with advice as to varieties and methods of cultivation. M. C. F. Whitley of the Dairy Branch of the Federal Department of Agriculture, gave

an address on cow-testing and results. Mr. Geo. H. Barr, also of the Dairy Branch, delivered an address on "Some Suggestions for Improvement in the Quality of Creamery Butter." Both Mr. Barr and Professor Dean, of the Ontario Agricultural College, referred to pasteurization, which was becoming a live question in the United States and which had been generally adopted in Saskatchewan, where 98 per cent of the cream manufactured into butter was so treated. A paper submitted by Mr. Frank Hens, of London, Ont., urged the grading of butter in a way that would establish a reliable standard for Ontario.

Addresses were also delivered by Mr. Wilfrid Sadler, of Macdonald College; Senator Derbyshire; Mr. J. R. Dargavel, M.P.P.; Hon. G. P. Graham; Mr. W. Bert. Roadhouse, Deputy Minister of Agriculture, Ontario, and Mr. A. Maclaren, secretary of the Ontario Agricultural College Y. M. C. A., the last-mentioned choosing for his subject: "Community Building and Community Builders."

Eighteen directors were chosen, who at a subsequent meeting elected: J. N. Stone, Norham, president; R. G. Leggett, Newboro, first vice-president; Jos. McGrath, Mount Chesney, second vice-president; T. A. Thompson, Almonte, secretary; M. Bird, auditor; and H. Glendinning, Manilla, Neil Fraser, Vankleek Hill, W. H. Olmstead, Bearbrook, J. A. Sanderson, Oxford Station, and J. B. Ferguson, Renfrew, members of the executive. Mr. Glendinning was also nominated representative to the Canadian National Exhibition, and the president, secretary and chief dairy instructor were appointed a committee to take charge of prosecution work for 1916.

THE WESTERN ONTARIO DAIRYMEN'S ASSOCIATION

The 49th annual convention of the Dairymen's Association of Western Ontario was held in St. Mary's, Ont., on January 12th and 13th. Addresses were delivered by W. Bert Roadhouse, Deputy Minister of Agriculture, and Dr. G. C. Creelman, President of the O. A. C., on "A Trip to the Orient;" Prof. H. H. Dean, Professor of Dairy Husbandry, O. A. C., on "Some Cheese Experiments; Investigations on Hand Cream Separators;" Prof. H. Barr, Chief, Dairy Division, Ottawa, on "Paying for Milk at Cheese Factories;" Geo. R. Harcourt, Professor of Chemistry, O. A. C., on "Lime and Lime Requirements of Ontario Soil;" C. F. Whitley, in charge of Dairy Records, Ottawa, on "Some Dairy Herd Records."

Other speakers were Geo. A. Putnam, Superintendent of Farmers' Institutes, Toronto; Prof. T. H. Lund, Professor of Bacteriology, O. A. C.; Prof. A. Leitch, Farm Foreman, O. A. C.; G. G. Publow, Chief Dairy Instructor and Sanitary Inspector for Eastern Ontario.

A number of resolutions were passed, among these being the following:--

RESOLVED, that this Association is in accord with any action that may be taken by the Federal Department of Agriculture for the purpose of encouraging the recognition of a national standard for Canadian dairy products.

RESOLVED, that this Association is in sympathy with any workable plan that

may be devised and put in operation by the Provincial Department of Agriculture tending to encourage a grading system for creamery products; also the support of this organization may be counted upon to encourage any movement which has for its object the placing in the hands of milk and cream producers, official and efficient milk and cream cooling tanks at cost.

RESOLVED, that this association is in favour of any action taken by the Federal

Department of Agriculture that will insure legislation, making the wholesale buying of milk and cream by measurement illegal.

The officers elected for 1916 are as follows: President, Jas. Bristow, St. Thomas; first vice-president, R. W. Stratton, Guelph; second vice-president, Wm. Rothwell, Hickson; third vice-president, J. MacHoover, Burgessville; secretary-treasurer, F. Hems, 48, Bank of Toronto, London.

THE OTTAWA WINTER FAIR

The Ottawa Winter Fair and Poultry Show was held at Ottawa from January 18th to 21st, 1916. The entries in each class as compared with those of last year, are as follows: -

	1916	1915
Horses	196	178
Cattle: beef and dairy	171	122
Sheep	317	150
Swine	133	76
Seed	396	81
Poultry, including eggs and dressed poultry	3,100	2,495
Totals	4,313	3,102

The apparent discrepancy in the seed entries between 1915 and 1916 is partly explained by the fact that last year the Eastern Ontario Seed Fair at Brockville was held simultaneously with The Ottawa Winter Fair.

STANDING OF COUNTIES IN CONTEST FOR WHITE TROPHY

COUNTY	Horses	Beef Cattle	Dairy Cattle	Sheep	Swine	Total
LANARK	156	241	209	183	267	1056
STORMONT	189	233	195	154	197	968
LENNOX AND ADDINGTON	126	256	273	164	140	959
GRENVILLE	124	160	153	178	263	878
FRONTENAC	166	232	190	172	108	868
LEEDS	165	200	183	162	133	843
NORTHUMBERLAND	76	220	149	190	167	802
DUNDAS	139	191	236	117	116	799
PRINCE EDWARD	106	180	236	148	53	723

THE DAIRY TEST

A three days' milking test was also held at the Ottawa Winter Fair. The championship was won by Desta, a mature

holstein, owned by Jas. Knapp, Merrickville, Ont., that gave 295.5 lb. milk, testing 2.8 per cent fat. The following records were made by the first prize animal in each pure-bred class:—

AYRSHIRES

Age, Months	Name	Owner	Lb. Milk	Per cent. Fat	Total Points
Over 48	Glenshamrock C'anty Again.	A. Hume & Co., Campbellford, Ont	170 4	3 9	216 62
Between 36 and 48	White Floss of Springbank.	Jos. Hudson & Son, Lyn, Ont	151 7	3 5	173 43
Under 36	Susana of Evergreen.	E. B. Palmer & Sons, Norwich, Ont.	146 7	3 5	169 26

HOLSTEINS

Over 48	Desta.	Jas. Knapp, Merrickville, Ont.	295 5	2 8	279 86
Between 36 and 48	Lyndewood Colantha.	W. J. Bailey, Jarvis, Ont.	228 5	3 3	250 87
Under 36	Lady Pauline Colantha.	A. E. Hulet, Norwich, Ont.	184 7	3 4	205 89

SHORTHORNS

Over 48..	Royal Princess.	S. W. Jackson, Woodstock, Ont.	140 3	4 2	185 86
Under 36.	Red Bess.	S. W. Jackson, Woodstock, Ont.	78 5	4 3	106 38

MANITOBA LIVE STOCK ASSOCIATIONS

The annual meetings of the Horse Breeders' Association, Cattle Breeders' Association, Sheep Breeders' Association and Swine Breeders' Association, of Manitoba, were held at Brandon, Man., on January 3rd, 4th and 5th. The attendance generally was the largest that has been recorded. It was decided to extend an invitation to the Royal Commission on Live Stock Markets, appointed in Saskatchewan, to extend its investigation to Manitoba. A resolution was approved, appointing a committee representing the Live Stock Associations of Manitoba, the Live Stock shippers and packers, the provincial Department of Agriculture, and Health of Animals Branch, Dominion Department of Agriculture, to inquire into the extent tuberculosis in cattle existed and to formulate a plan of eradication.

Recent legislation regarding the enrolment and inspection of stallions was approved by the Horse Breeders' Association.

At the sheep breeders' meeting, Mr. G. H. Greig, the secretary, stated that about 75,000 pounds of wool had been handled in the co-operative way during the summer, netting the shippers around 25 cents a pound, and raising the price paid by dealers. Two hundred breeders consigned their wool to the Department in amounts ranging from 13 to 9,302 pounds. On transactions representing in the neighbourhood of \$20,000 the cost to the Department had been \$249 in excess of the receipts. Resolutions were passed commending the work

of the provincial Department of Agriculture in handling wool; expressing appreciation of the Sheep Branch of the Federal Department of Agriculture, and requesting the latter Department to arrange sale dates for the wool clip of the different provinces.

The officers elected were as follows:--

CATTLE BREEDERS' ASSOCIATION

President: J. R. Hume, Souris; vice-president, Walter J. Cummings, Winnipeg; directors, D. Stewart, Gilbert Plains, J. G. Barron, Carberry, J. A. Chapman, Hayfield, John Graham, M.P.P., Carberry.

HORSE BREEDERS' ASSOCIATION

President, J. G. Washington, Ninga; vice-president, John Scarff, Hartney; directors, Wm. McKirdy, Napinka, A. C. McPhail, Brandon, W. H. Galbraith, Hartney, Freeman Rice, Binscarth.

SHEEP BREEDERS' ASSOCIATION

President, George Gordon, Oak Lake; vice-president, A. J. Mackay, Macdonald; directors, A. D. Gamley, Griswold, T. Jasper, Harding, J. R. Hume, Souris, W. H. English, Harding, J. A. Chapman, Hayfield.

SWINE BREEDERS' ASSOCIATION

President, A. D. McDonald, Napinka; vice-president, Andrew Graham, Pomeroy; directors, J. Strachan, Pope, P. McDonald, Virden, J. H. Dalgleish, Grandview, D. W. Agnew, Douglas, C. A. Mack, V.S., Gilbert Plains, J. A. Chapman, Hayfield.

THE CANADIAN RED-POLLED ASSOCIATION

The annual meeting of the Canadian Red-Polled Association was held in Brandon, on Jan. 6th.

Red-Polled Cattle make a strong claim as dual purpose animals, being deep and rich milkers, and possessing good beefing qualities. An animal of this breed, from a herd exhibited at the Winnipeg Exhibition in 1914, has just completed a marvellous record, showing a gross earning capacity of \$1000 yearly for milk alone, producing 20,280 lb. of milk, containing 891 lb. butter fat in the year.

As the name indicates, animals of this breed are polled and solid red in colour, they are very docile, and transmit their good qualities. The breed is not very well known in Canada as yet, but their numbers

are increasing. Most of the breeders reside in Western Canada, Manitoba and Saskatchewan having the largest representation. A booklet descriptive of the breed may be had on application.

Officers for the ensuing year, as elected at the annual meeting, are as follows:—

President, W. J. McComb, Beresford, Man.; Vice-president, H. V. Clendenning, Harding, Man.; Directors, H. E. Waby, Enderby, B.C., J. H. Elliott, Irma, Alta., H. O. Hutchins, Keeler, Sask.; J. A. Englund, Bergfield, Sask.; George Skinner, Roland, Man.; Secretary, George H. Greig, Winnipeg; representatives to National Record Board, President and Secretary.

SASKATCHEWAN DAIRYMEN'S ASSOCIATION

The first annual convention of the Saskatchewan Dairymen's Association was held at the College of Agriculture, Saska-

toon, on January 5 and 6. Morning and afternoon sessions were held, in which subjects on practical dairying were dis-

cussed. The following resolutions were passed:

Resolved, that this convention is of the opinion that it would be advisable that abattoirs under Government supervision, be established in the province on co-operative plans similar to those of co-operative elevators or co-operative creameries and that this resolution be handed to the Live Stock Commission which is about to meet.

Resolved, that we approve of the course of action taken by our dairy commissioner, Mr. W. A. Wilson, in the grading of the cream and butter, and trust that creamery patrons will support this action by supplying the very best cream possible.

Resolved, that this convention recommend that all new milk and cream

shipping cans be standardized as to exact type and capacity.

Whereas, and in view of the growing importance of the dairy industry to our province and the rapidly increasing need and desire of our farmers to acquire more and better dairy stock,

Be it therefore resolved, that we, the delegates of this convention hereby express our approval of the policy of the Government whereby these cattle are made available, but urge that a larger appropriation is required to meet the most pressing needs and circumstances of our farmers.

The officers elected are as follows:—President, Geo. Harris, Paynton; vice-president, L. C. Wirtz, Wadena; secretary-treasurer, K. G. MacKay, Saskatoon.

THE ALBERTA DAIRYMEN'S ASSOCIATION

THE annual convention of the Alberta Dairymen's Association was held in Calgary on December 15th and 16th. Mr. C. Marker, provincial Dairy Commissioner, reported for the year ending October 31st, 1915, the production of 7,400,000 lb. of creamery butter as compared with 5,450,000 lb. for the previous year. This quantity was manufactured in 58 creameries supplied by 14,000 dairy farmers, as compared with 46 in 1914.

The output of cheese from 13 factories was 372,692 lb. as compared with 70,581 lb. made in five factories during the season of 1914. Unanimous resolutions were adopted recommending the standardization of butter packages, the general adoption of pasteurization of cream for butter making in the creameries of the province and for the extension of the butter grading service.

THE ALBERTA SWINE BREEDERS' ASSOCIATION

THE annual meeting of the Alberta Swine Breeders' Association was held at Calgary on December 16th. The Secretary was instructed to take up with the railways the question of having proper chutes provided for unloading hogs from wagons at the stock yards. It was decided to hold the annual sale of pure-

bred swine in conjunction with the sheep sale to be held in the autumn. The following officers were elected: President, Lew Hutchinsonson; 1st vice-president, H. S. Currie; 2nd vice-president, W. J. Hoover; secretary, E. L. Richardson, Calgary.

THE ALBERTA SHEEP BREEDERS' ASSOCIATION

THE annual meeting of the Alberta Sheep Breeders' Association was held in Calgary on December 15th. The Secretary reported that the Association had handled for its members 95,450 lb. of wool, for which an average price of \$27.77 cents a pound was received. The thanks of the Association were voted to the Dominion Live Stock Commissioner for supplying expert wool graders and a

request made that this service be again provided for the coming year. It was decided to hold the annual sale of purebred and grade sheep at the beginning of October next. The following officers were elected: President, C. W. Peterson; 1st vice-president, R. Knights; 2nd vice-president, P. M. Bredt; secretary, E. L. Richardson, Calgary.

BRITISH COLUMBIA POULTRY ASSOCIATION

The convention of the British Columbia Poultry Association was held at Chilliwack, January 6th, 1916. The most important work transacted was the drafting of an

Egg Marks' Act. This was unanimously endorsed by the directors representing 32 local associations aggregating upwards of 2,000 members. Petitions are to be forward-

ded to all provincial and Dominion members, all provincial boards of trade, farmers' and women's institutes. Amongst other items dealt with might be mentioned that instead of holding more than a score of poultry shows in the province each year, six or eight districts are to be grouped and

a show held in each group. The next provincial show and annual convention is to be held at Nelson, B.C., December 11th to 15th. Special cash prizes are to be offered for competition amongst contestants in the Fifth International Egg-laying Contest.

NEW PUBLICATIONS

THE DOMINION DEPARTMENT OF AGRICULTURE

THE DOMINION EXPERIMENTAL FARMS

Report for the Year Ending March 31st, 1915. As for the year ending the last day of March, 1914, so in the succeeding year, the annual report of the Experimental Farms for purposes of publication is divided into two volumes, the first of which is now ready for circulation. A further division is into Section A, and Section B. Section A comprising the report of the Director with general notes and synopses of the work of the various divisions, Branch Farms, Stations and Sub-stations, and Section B the Chemistry, Field Husbandry and Animal Husbandry (Beef Cattle, Dairy Cattle and Dairying, Horses, Sheep and Swine) reports. The volume consists of 574 pages, not including a series of plates of types of animals, of conditions of animals resulting from various methods of feeding, and of scenes taken at different stages of farming, breaking land, stump removing, etc. The extent and growth of the Experimental Farm system and the contents of a volume describing in detail scope of the operations carried on under that system are perhaps best illustrated by quoting the first paragraph of the Director's report under the head of "Publicity." "Since the inauguration of the Experimental Farms in 1886," that paragraph runs, "with a Central Farm as headquarters at Ottawa and four branch Farms—one in each of the provinces of Nova Scotia, Manitoba, Northwest Territories, and British Columbia—the Farms system has expanded until to-day there are twenty-nine Experimental Farms, Stations, and Sub-stations established throughout the Dominion, where systematic experimental and research work is being conducted by specially trained investigators seeking to solve the innumerable problems which underlie successful farm operations. There Farms and Stations are equipped and maintained for the special benefit of the farmers of Canada, and our aim is to place before these farmers in a practical and understandable manner the results of our experiments and investigations."

THE TOBACCO DIVISION

Tobacco Seed Beds, by F. Charlan, Chief of the Tobacco Division. If Bulletin No. 21 of the Tobacco Division is not "a complete account of all the methods used in the production of tobacco seedlings," as indicated in the introduction, it is at least a full exposition of the subject with which it exclusively deals in a manner that thoroughly warrants fulfilment of the hope expressed by the Director of Dominion Experimental Farms, that the information supplied will help tobacco growers to solve some of the many problems which confront them at seed time. The Bulletin is divided into six sections or chapters, the first dealing with "Types of Beds," the second with "The Soil of the Seed Bed," the third with "Shelters," the fourth with "Seed-Sowing and Maintenance of the Bed," the fifth with "Diseases of Tobacco Seedlings," and the sixth with "Making of the Sun-Hot Bed." A number of well-defined plates showing the beds at various stages emphasize the value of the work, which is further increased in interest by an Appendix giving the "Comparative Temperatures of Hotbeds, Semi-Hotbeds and Greenhouses" with a table of records and an enlarged diagram.

THE DAIRY AND COLD STORAGE BRANCH

Report of the Dairy and Cold Storage Commissioner, for the fiscal year ending March 31st, 1915. This is a comprehensive report of a hundred pages. Opening with the report proper of the Dairy and Cold Storage Commissioner, in which the prime position that Canadian cheese has attained in Britain is especially noted, the reports of the Assistant Dairy Commissioner, of the Chief of the Extension of Markets Division and of the Chief of the Dairy Division follow. Then come statistics, records and other facts regarding cow testing and dairy herd records in the different provinces. After these are given the report of the Cold Storage Inspector, of the Chief Inspector of Dairy Products, of the Fruit, Cold Storage and Transportation Investigating Division and of the Inspector of Weighing of Butter and Cheese. A var-

ity of statistical tables of exports and imports of butter and cheese and other farm products for a number of years conclude a very complete departmental publication.

THE PROVINCIAL DEPARTMENTS OF AGRICULTURE

PRINCE EDWARD ISLAND

The Teacher's Magazine, the first number of which made its appearance as a Christmas issue, but which is to be published monthly under the ægis of The Teacher's Association of Prince Edward Island, is a promising publication of some sixty pages. Delay was caused in the issuing of the first number by Mr. Vernon Crockett, its intended editor, joining the army. Mr. J. O. Seaman is now the editor and the conducting of the various departments have been undertaken by some of the best known educationists in the province. Professor S. B. McCready, of Prince of Wales' College, has assumed charge of Nature Study.

NEW BRUNSWICK.

Annual Report of the Schools, 1913-1914, by the Chief Superintendent of Education. This report makes a blue book of upwards of three hundred pages. Part 1 contains the General Report of number of schools, teachers, pupils, etc., with per centages of attendance, school grants, subjects of study, lists of prize winners and so on. Part 2 consists of statistical tables, of results by grade, of expenditure, teachers' salaries and allowances. Part 3 comprises the Appendices, giving subsidiary reports, details of the work of the different divisions of the educational system, report of the Interprovincial Educational Convention, held at Halifax, August 26th, 27th and 28th 1914, and some advice on "How to Study."

MANITOBA

Report of the Department of Education for the year ending June 30th, 1915. In 1905, or ten years ago, according to this report, number of students engaged in work above the entrance was 3,238; last year, that is in 1915, it was 6,387, an increase of practically 100 per cent. The summer schools for teachers are also being splendidly attended. Thus educational matters in Manitoba are progressing. The report is a grey-covered publication of 174 pages adorned with upwards of thirty full-page or half-page illustrations and a frontispiece consisting of a life-like portrait of Major Joseph McLaren, Physical Instructor of Brandon schools, killed in the battle of St. Julien, April, 1915. A noteworthy remark is that during the year 400 school gardens were reported as worthy of mention and 63 boys' and girls' clubs were in operation with a membership of over 5,500.

A call for subscriptions for the Red Cross fund sent out during the winter of 1914-15 to the children brought subscriptions from 23,215 pupils of 792 schools the total of cash received and forwarded being \$3,566.19.

Agricultural College Calendar, 1915-16. The rapid development of agricultural education of the higher order is well illustrated by the early history of the Manitoba College of Agriculture. Though it was in 1902, in 1903 it was favourably reported on by a commission that had been appointed. In 1905 active building operations began and in 1906 the College was formally opened. In 1907 affiliation with the University of Manitoba came about. In 1912 the college was granted degree-conferring powers and in the following year the first convocation for the conferring of degrees was held. These facts are set forth in the Calendar for 1915-16, which is a publication of 122 pages, twenty pages being devoted to the Home Economics' section and eight to announcements regarding special courses.

SASKATCHEWAN

Seed Catalogue for School Gardens is the title of School Agricultural Circular, No. 4, issued by the provincial Department of Education. Besides a list of some six dozen varieties of seeds of every kind that can be obtained at about an average of 4 cents a package, or 27 packages for a dollar, instructions are given and blanks supplied for ordering.

Calendar of the University of Saskatchewan. Session 1915-16. In a brief sketch of the College of Agriculture connected with the University, the Calendar states that the college farm covers 880 acres and the experimental plots 160 acres. The soil is a chocolate clay loam with clay subsoil. The main farm is devoted to diversified farming; quite a large acreage of wheat and other grains, corn, roots, grasses and legumes being raised each year. A quarter section is devoted to demonstration and investigation work in field husbandry, plant breeding, methods of tillage, crop rotations and soil fertility. About fifty acres are used for the farm buildings, including a judging pavilion and barns and poultry houses. Forty acres is used by the Horticultural Department. Short courses and conventions are held in the stock pavilion, where there is seating capacity for about 400. The course leading to the degree of Bachelor of Science in agriculture covers a period of four years and that leading to the certificate of Associate in Agriculture covers three years. Students for these courses must be at least 16 years of age. A Bachelor of Science who wishes to take a Master's degree must have a reading knowledge of French or German. The Calendar comprises 164 pages.

BRITISH COLUMBIA

Honey Production in British Columbia, Season of 1915, Circular No. 9, by F. Dundas Todd, Foul-Brood Inspector. This report shows that of 1,160 beekeepers in the province 326 reported their honey crop for the season 1915. These beekeepers had in April 2,417 colonies, the returns from which during the year amounted to 57,245 lb. It is assumed from these figures that the total honey crop of the province was probably about 100 tons. This is said to be one of the poorest yields per colony in the experience of the British Columbia beekeeper. This pamphlet offers suggestions to bee-keepers with respect to ordering supplies and other matters.

British Columbia Timber for Prairie Farms. Under this caption, a series of four-teen bulletins has been issued by the Forest Service of the British Columbia Department of Lands. Messrs. A. R. Greig, Professor of Agricultural Engineering, and A. M. Shaw, Professor of Animal Husbandry, Saskatchewan College of Agriculture, are the authors.

The series is divided into two sections as follows:

FARM BUILDINGS SERIES

1. Combination or General Purpose Barns for Prairie Farms.
2. Dairy Barns, Milk and Ice Houses for Prairie Farms.
3. Beef Cattle Barns for Prairie Farms.
4. Horse Barns for Prairie Farms.
5. Sheep Barns for Prairie Farms.
6. Piggeries and Smokehouses for Prairie Farms.
7. Poultry Houses for Prairie Farms.
8. Implement Shed and Granaries for Prairie Farms.
9. Silos and Root Cellar for Prairie Farms.
10. Farm Houses for Prairie Farms.

TIMBER SERIES

11. British Columbia Box Woods.
12. How to finish British Columbia Woods.
13. British Columbia Tie Timber.
14. British Columbia Dimension Timber.

Plans, dimensions and tabular statements of the material required are given in each instance. The particular uses to which the material is to be applied and the quantity necessitated are also supplied in detail along with a deal of information as to methods and procedure. At the end of each bulletin the woods that should be used are set forth along with instructions for ordering and statements of the value of wood in building. In prominent letters

the further information is given that British Columbia has four hundred billion feet of timber ready for use, half of Canada's supply.

The Timber Resources of British Columbia is a forty-page pamphlet issued by the Forest Branch of the Provincial Department of Lands, and devoted to a description of the principal export timber trees, their qualities and values. The trees especially referred to are the Douglas Fir, Western Hemlock, Western Red Cedar and Sitka Spruce. Some of the uses to which the different woods can be put are described as well as the methods of treatment required. Chapters deal with trade inquiries and with "other forest products", the publication closing with the remark "British Columbia has a wood for every use."

How to Finish British Columbia Wood is another of the series of publications issued by the Forest Branch of the Provincial Department of Lands. It is a booklet of sixteen pages designed, as stated in the introduction, to bring to the attention of wood-finishers, builders, architects and prospective home-makers the desirability of selecting British Columbia woods for interior finishing of their homes, offices and other buildings. It also gives instructions in the manner that the wood should be surfaced, stained, varnished or painted.

Report of the Director of Elementary Agricultural Education. This report is a reprint from the Provincial Public Schools Report of 1914-15 and covers 12 large pages, not including a series of eight particularly clear half-page plates, chiefly of school-gardening scenes. From it the information is gleaned that the first summer course in rural science for teachers, held in 1914, attracted 171 teachers—44 male and 127 female—and the second course, held last year, 260 teachers—123 males and 137 female. A full list of the subjects included in the courses is given and progress reported. Extracts from the section devoted to school gardening are given in Part III of this number of THE AGRICULTURAL GAZETTE.

MISCELLANEOUS

Two addresses delivered by Dr. C. Gordon Hewitt, D.Sc., Dominion Entomologist, have been issued in pamphlet form. One under the heading of "The Protection of Birds" is a reprint from the sixth annual report of the Commission of Conservation, and the other, entitled "The Protection of Birds in and Around Ottawa", is reprinted from *The Ottawa Naturalist*, and is an abstract of an illustrated lecture delivered before the Ottawa Field Naturalists' Club.

BOOK REVIEWS

Problems in Farm Work, by Samuel A. Blackburn, Director of Manual Training, Oak Cliff High School, Dallas, Texas. The Manual Arts Press, Peoria, Ill.; 129 pages, 10 inches by 6½ inches, including 60 plates of designs. Price, \$1.

It is claimed for this work that it is the first on woodworking for manual training as devoted exclusively to projects for use on the farm. Intended a practical text book for agricultural schools, high schools, industrial schools and country schools, it is admirably adapted for the purpose sought. The author's experience in rural school work and his close co-operation with farmers, fruit growers, bee-raisers, carpenters, and other workers has enabled him to secure the best type of each problem and the design best fitted for its particular use. The one hundred problems which the book contains are not only practical for manual training school construction but they are extremely practical. The information on each problem is unusually complete and the book is a distinct contribution to the literature in this field. Rural schools and schools of agriculture as well as the boy on the farm will find the work a valuable aid.

The Fundamentals of Live Stock Judging and Selection, by Robert S. Curtis, B.S.A., Associate Chief, Animal Industry Division, North Carolina Agricultural Experiment Station, West Raleigh, N.C.; Lea & Febiger, Philadelphia and New York; 455 pages, 8 inches by 5 inches, illustrated with 180 engravings.

It is set forth in the preface of this useful work that any individual who selects stock is placed in the position of judge. That is the crux of the entire situation. Stock-buying is not the speculative game some people seem to regard it. In order to reap profit, traders must have knowledge and this book is well calculated to help both beginners and those with experience to pointers that cannot fail to be of advantage. There are fourteen chapters with bibliography, a glossary of terms and an elaborate index. The first five chapters deal with the methods and practices and general principles applicable to the judging and selection of all classes of live stock. In the fifth chapter information is included relative to important factors or problems of the individual, the breeds and the selection of the same, otherwise than by an external examination on which student and show ring judging is necessarily based. One chapter is devoted to the jack, jennet, and mule.

A complete and convenient reference to breed descriptions through photographs

and concise breed characteristics is included and supplemented with the latest standard of excellence and scale of points of each of the important breeds. Market and show ring considerations are discussed fully because of the tendency toward the more practical phases of commercial or market live stock judging.

Imperial Year Book for Canada, 1915-16; edited by A. E. Southall, assisted by C. H. Moody; second year of publication, \$1.50 cloth, \$1 paper; Montreal, John Lovell & Son, Limited, printers; 662 pages, 8¾ inches by 5¾ inches.

The Imperial Year Book seeks to do for Canada what Whitaker's Almanac does for Great Britain. Its methods and contents are very much of the same character as those of the older publication. It gives a diary of the war, a deal of naval and military information and a mass of details gathered from official sources relating to the empire with especial attention to political, social, religious, commercial and financial matters in the Dominion and the provinces.

Twenty Lessons on Poultry, by C. T. Patterson, Pathologist and Professor in charge of the Experimental and Extension Department of the Missouri State Poultry Experimental Station, and edited by Frank E. Hering; J. B. Lippincott Company, Philadelphia and London; 92 pages, 7¾ x 5 in.

While this little book has been prepared primarily for consumption by the boys and girls of the United States, it would be impossible for such a work not to be of universal interest and value. It is described on the title page as an Elementary Treatise prepared under the direction of the American Poultry Association and being so it will be understood that the contents are of an intensely practical nature. The lessons are divided in this order: Origin and history of Fowls, Nomenclature Diagram of Fowl, Characteristics of Fowls, Breeds and Varieties (three lessons), Turkeys, Ducks and Geese, Judging, Housing, Equipment, Yarding and Fencing, Feeds and Feeding, Feeding and Baby Chicks, Mating, Incubation, Brooding, Enemies, Diseases, Care and Management, and a review embracing fifty questions. An appendix supplies a Glossary of Technical Terms, and an advocacy and suggestions for clubs, contests and school fairs. Upwards of fifty illustrations adorn and increase the value of the text.

NOTES

The death occurred at Penhold, Alta., on December 21st, 1915, of Mr. James Speakman, President of the United Farmers of Alberta.

Six thousand sheep have been taken by the Natural Resources Department of the Canadian Pacific Railway into the irrigated district east of Lethbridge, for winter feeding on the ready-made farms in that district.

Among the exhibits at the San Diego exhibition were a thousand boxes of apples from British Columbia, shipped under instructions to Mr. R. G. L. Clarke, Dominion Fruit Inspector at Vancouver, B.C.

At a conference of country school superintendents held at Columbus, Ohio, recently a plan was approved to make the advertising and promoting of boys' and girls' competitions a part of the educational work of the state.

The Weed and Seeds Branch of the Saskatchewan Department of Agriculture is prepared to test for Saskatchewan farmers grain for germination, and, if required, will make a report of impurities found. This service is granted free to farmers of the province.

The Saskatchewan provincial labour bureau placed a total of 26,750 harvest hands during the past season. Of this number 16,230 were obtained from Eastern Canada, 2,600 from British Columbia, 7,250 from the various cities of the province and 1,700 soldiers from the various military camps.

One of the activities of the Farmers' Club in Pennington Co., Minn., consists of instruction in meat cutting. The High School Agriculturist gives lectures and cutting demonstrations at the club meetings and on set dates carcasses are dissected by the pupils under the supervision of the agricultural director.

Following a system adopted in Wisconsin, Illinois and Iowa, the Department of Agriculture of the University of Minnesota has decided that it will formally recognize men who render distinguished service to the rural life of the state. Such recognition will take the form of diplomas bearing the great seal of the University.

Eighteen members of a Boys' Club in California last summer went on a three-days' trip, from the 5th to the 8th of June. All, except the two members who drove motor cars to carry the provisions and blankets, rode bicycles. They covered a total of about 75 miles and were able to study the several different types of farming.

The Departments of Agriculture and of Education of the province of Saskatchewan are co-operating in the matter of school garden work. The Department of Agriculture has undertaken to provide the seeds of vegetables, flowers, grasses, cereals and trees at a reduced price. A catalogue of the seeds offered has been placed in each school district in the Province.

According to *The Census and Statistics Monthly* up to the end of October, 1915, 12,221,117 lb. of raw beetroot sugar, equivalent to 11,315,849 lb. of refined sugar were obtained in Canada from 48,197 short tons of sugar beetroot. At the same date in 1914, the corresponding figures were 12,295,200 lb. of raw sugar from 48,480 short tons of roots worked.

In 1914 the members of the Belleville Cheese Board organized a Patriotic and Red Cross Fund, into which each farmer gave one day's milk to be made into cheese, the cash from which when sold was handed to the treasurer of the Board for patriotic purposes. The sum realized was \$4,000. In 1915 in a similar manner \$3,000 was raised, and was used to supply Red Cross Societies and Women's Institutes with money to purchase materials to be made up for the comforts of Canadian soldiers in British hospitals.

In sundry districts of Minnesota provision is made in the creameries for the keeping of eggs and poultry. Facilities are also offered for marketing the same. Stringent rules are laid down for the guidance of consignees. The eggs must not be more than four days old; they must be gathered twice a day; they must be of uniform size, must be clean and kept in a cool cellar; each egg must be stamped, the brown being separated from the white. Fines and suspension are visited on violators of the rules, or if any bad eggs are marketed. Improved prices are obtained for the eggs under these conditions.

The Rural Science Bulletin of Nova Scotia for January, edited by L. A. De Wolfe, M.Sc., Director of Rural Science Schools, announces that eggs will be sold to school children by the Agricultural College at 40 cents a setting; the balance will be paid by the Rural Science Department. In the same way strawberry plants will be supplied at 25 cents per hundred.

The Department of Agriculture of New Brunswick has supplied a generous quota of men for overseas service, the following officials having enlisted: L. C. D'Aigie, Dairy Superintendent; B. T. Reed, Assistant Field Husbandman; R. Newton, B.S.A., Director of Agricultural Education; D. B. Flewelling, Second Assistant Horticulturist; W. D. Ford, Provincial Animal Husbandman.

Recently on the invitation of Hon. A. C. Flummerfelt, Minister of Finance of British Columbia, representatives of fourteen of the sixteen banks doing business in the province met at an informal dinner in Victoria to discuss steps that might be taken for the improvement of the industries of British Columbia, more especially those of farming, cattle raising, lumber, mining, and fruit.

That the five or six billion dollars' worth of plant and animal products annually grown in the United States of America can be increased 10 per cent by selection and breeding is not seriously doubted by those able to judge. The addition of ten billion dollars' worth of products every twenty years by readjusting the hereditary tendencies of our crops and animals at a merely nominal cost is as important as the development of electrical methods and appliances or as the perfection of a system of railways and public roads, or as our entire foreign commerce. It is certainly a good business proposition to develop breeding projects rapidly and freely. The evidence shows that this proposition is every year developing into a form that cannot be ignored. Our country is destined to see breeding projects developed, as it has seen mechanical projects grow. Our plant and animal forces are fully as potent economic factors as our mechanical forces, and are worthy of as serious efforts to develop them.—Professor W. M. Hays, Assistant Secretary of Agriculture of the United States.

The value of the demonstration orchard system in the province of Quebec is brought out in the *Macdonald College Magazine* for December-January, where it is shown that an orchard, before being taken over for demonstration purposes, was about to be cut down by the owner. Last year this orchard gave a crop valued at \$900. The proprietor has since set out a young orchard and will set out another in a few years.

The Homemakers' Clubs of the province of Quebec have been devoting their efforts towards aiding in Red Cross and patriotic relief work generally. There are few of what may be termed the extra requirements of the soldiers that they have not lent themselves to. Some thousands of bandages have been prepared and sent forward during the past year, as well as a thousand pair of well-knitted wool socks, a large amount of hospital requirements, bed equipment and winter comforts, as well as good things for the table, jellies, jams, etc. In addition upwards of \$1,500 in cash was subscribed. The good work will be continued this year, nearly thirty clubs contributing. The majority of the clubs devote special days to the task, in hand, also co-operating with the different patriotic societies. In instances the boy scouts have lent valuable aid.

In Broome County, New York, the work of a Government County Agent so appealed to a large commercial institution that the directors set aside \$100,000 to assist in the enterprise, at the same time hinting that a million dollars would be available if necessary. The \$100,000 was to be used at the rate of \$1,000 per county for counties that would organize in support of the work for two years. The money was expended through the Council of Grain Exchanges, with an energetic agent in charge of it. This apparent philanthropic movement is believed to have been inspired by a desire, on the part of the business concern, to get into harmonious relations with farmers. It was realized that in building up the agriculture surrounding the town that business would be benefited almost in direct proportion as the farmers had increased funds to spend. The immediate effect of this work was that Chambers of Commerce, bankers and commercial men in many sections of the county took an active interest in the organization of agricultural extension work.

INDEX TO PERIODICAL LITERATURE

Potash in Agriculture,

B. C. Aston, F.I.C., *Journal of Agriculture*, Wellington, New Zealand, October 20th, 1915, page 283.

Building Up the Farm Wood Lot,

E. F. Moon, *The Country Gentleman*, Philadelphia, Pa., December 4th, 1915, page 1822.

Mechanical Seed Selection,

Seager Wheeler, Rosthern, Sask., *The Grain Growers' Guide*, Winnipeg, Man., December 20th, 1915, page 9.

Agricultural Education in Manitoba Schools,

H. W. Watson, Director of Elementary Agriculture, Manitoba Department of Education, *The Nor'-West Farmer*, Winnipeg, December 20th, 1915, page 1068.

Manitoba Short Courses,

The Nor'-West Farmer, Winnipeg, December 20th, 1915, page 1094.

Romantic History of Canadian Wheats,

C. C. James, C.M.G., LL.D., *Monetary Times*, Toronto, December 24th, 1915, page 5.

The Child's Garden,

The Country Gentleman, Philadelphia, Pa., December 25th, 1915, page 1954.

Farmer's Magazine, Toronto, January, 1916,

The Iron is Hot. Series of three articles on the Need, the Way and the Trail, that lead to a right solution of all farmers' troubles, by Sir Horace Plunkett, page 3.
Placing a Farm on its Feet, by Alonza Brown, page 12.
Making the Frills Pay, by R. J. Messenger, page 17.
Does Dairying Pay? by Prof. H. H. Dean, page 19.

Market Requirements and the Profitable Production of Hogs,

H. Barton, *The Journal of Agriculture and Horticulture*, Montreal, January 1st, 1916, page 148.

The Meat Producing Industry of the United States.

J. R. Brown before the American Meat Packers' Association, *The Nor'-West Farmer*, Winnipeg, January 5th, 1916, page 18.

Crops that Grow Crops,

William Harper Dean, *The Country Gentleman*, Philadelphia, Pa., January 1st, 1916, page 3.

The Cattle Man's Survival,

H. Higginbotham, *The Grain Growers' Guide*, Winnipeg, Man., January 5th, 1916, page 7.

A Missouri School,

Mrs. Marie Turner Harvey, *The Grain Growers' Guide*, Winnipeg, January 5th, 1916, page 9.

Government Live Stock Distribution in Saskatchewan,

P. F. Bredt, Acting Live Stock Commissioner, *The Nor'-West Farmer*, Winnipeg, January 5th, 1916, page 17.

Origin and Early History of the Grange.

Interesting account of how this Order rose to a membership of over 700,000 in the United States, then fell into almost complete decline, and has now begun to rise again.

The Nor'-West Farmer, Winnipeg, January 5th, 1916, page 47.

Growing Registered Seed Wheat,

Paul Gerlach, *The Farmer's Advocate*, Winnipeg, January 5th, 1916, page 7.

The Improvement of the Dairy Herd,

E. A. Weir, B.S.A., *The Farm Ranch Review*, Calgary, January 5th, 1916, page 7.

Draft Horse Prospects in America,

The Farm Ranch Review, Calgary, January 5th, 1916, page 11.

The Fertilizer Situation in the United States,

The Secretary of Agriculture, *Fruit and Produce Marketer*, Portland, Ore., January 6th, 1916, page 4.

What the Wheat Crop Means,

C. C. James, C.M.G., LL.D., *The Monetary Times*, Toronto, January 7th, 1916, page 218.

Half Billion Bushels No. 1 Hard,

James Carruthers, *The Monetary Times*, Toronto, January 7th, 1916, page 218.

Forward Movements in Agriculture,

J. B. Reynolds, President of the Manitoba Agricultural College, *Farmer's Advocate*, Winnipeg, January 19th, 1916, page 85.

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DEPARTMENT OF AGRICULTURE

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CONTENTS

	PAGE
To Promote Efficiency.....	205
The Conservation of Breeding Cows.....	206

PART I

DOMINION DEPARTMENT OF AGRICULTURE

The Exhibition Branch:—	
Canada at San Diego.....	208
The Dominion Experimental Farms:—	
The Division of Animal Husbandry:	
A Cattalo Herd Established.....	208
The Division of Botany:	
Scarcity of Seed Potatoes, by H. T. Güssow.....	210
Plant Diseases vs. National Wealth, by H. T. Güssow.....	211
The Division of Forage Plants:	
The Inoculation of Alfalfa, by M. O. Malte.....	213
The Entomological Branch:—	
Injurious Shade Tree Insects of the Canadian Prairies, by J. M. Swaine.....	215
The Dairy and Cold Storage Branch:—	
Conference of Dairy Recorders.....	221
Spread of Cow Testing Associations.....	221
High Cost of Rennet Extract.....	221
Peach Package Tests—Season of 1915, by J. M. Creelman.....	222
The Seed Branch:—	
New Control System for Marketing Seed Corn in the Ear, by Geo. H. Clark.....	226
The Fruit Branch:—	
Notes Regarding Season 1915-16, by H. B. Robinson.....	228
The Health of Animals Branch:—	
Meat and Canned Foods Division:	
The Sex of Cattle Slaughtered.....	230
The Animal Contagious Diseases Act Amended.....	230

PART II

PROVINCIAL DEPARTMENTS OF AGRICULTURE

The Value of Farm Production in 1915:—	
Prince Edward Island, by Theodore Ross.....	231
Nova Scotia, by M. Cumming.....	231
New Brunswick, by J. B. Daggett.....	232
Quebec, by H. Nagant.....	233
Manitoba, by A. J. McMillan.....	234
Saskatchewan.....	234
Alberta.....	235
The Selection and Equipment of District Representatives' Offices:—	
Prince Edward Island, by Theodore Ross.....	236
Nova Scotia:—	
District Representative Headquarters, Antigonish, by Rev. Hugh McPherson.....	236
The Lawrencetown Demonstration Building.....	238
Quebec, by H. Nagant.....	238
Pontiac County, by J. K. King.....	241
Ontario, by C. F. Bailey.....	241
Saskatchewan, by F. H. Auld.....	244

Farm Labour:—	
New Brunswick, by J. B. Daggett.....	245
Quebec, by S. Dufault.....	245
Ontario, by W. Bert Roadhouse.....	246
Saskatchewan, by Thos. M. Molloy.....	246
Alberta, by Chas. S. Hotchkiss.....	247
Weed Control:—	
Ontario, by J. E. Howitt.....	249
Saskatchewan, by Thos. Domaille.....	250
Alberta, by James D. Smith.....	251
British Columbia, by W. E. Scott.....	253
Nova Scotia:—	
The Science Building, by M. Cumming.....	254
The Growing of Turnip Seed, by John M. Trueman.....	256
New Brunswick:—	
Competitions for Boys and Girls.....	257
Quebec:—	
Quebec Farmers' Agricultural Union.....	258
The Sixth Provincial Seed Grain Exhibition, by H. Nagant.....	259
A Poultry Association for the Province of Quebec.....	260
Short Courses in Agriculture.....	260
The Maple Sugar Industry.....	261
Ontario:—	
The New Physics Building.....	261
Demonstration Lecture Courses for Women's Institutes, by Geo. A. Putnam...	264
Saskatchewan:—	
The Patriotic Agricultural Scheme, by S. W. Yates.....	267
Contest in the Raising and Feeding of Swine.....	268
The Duty of the Dominion.....	269

PART III

RURAL SCIENCE

The Beautification of School Grounds:—	
Prince Edward Island, by H. H. Shaw.....	270
Nova Scotia, by A. H. MacKay.....	270
Quebec, by J. C. Magnan.....	272
Macdonald College, by J. E. McOuat.....	273
Ontario, by J. B. Dandeno.....	274
Manitoba, by H. W. Watson.....	275
Saskatchewan, by A. W. Cocks.....	277
British Columbia.....	278
New Brunswick:—	
School Fairs, by R. P. Steeves.....	281
The Teachers' Winter Short Course, by R. P. Steeves.....	282

PART IV

SPECIAL CONTRIBUTIONS, REPORTS OF AGRICULTURAL ORGANIZATIONS, NOTES AND PUBLICATIONS

Societies and Associations.....	284
New Publications.....	291
Book Reviews.....	294
Notes.....	294
Index to Periodical Literature.....	296

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OF CANADA

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THE AGRICULTURAL GAZETTE of Canada is published monthly, in English and in French, by the Dominion Department of Agriculture. It is not intended for general circulation. A limited number of copies, however, are available to subscribers at \$1.00 per annum, or 10 cents per copy.

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TO PROMOTE EFFICIENCY

IN the preceding part of this report reference has been made to various causes contributing to the increase in commodity prices, with suggestion for improvement in existing conditions.

We look for such improvement through land settlement, greater attention to mixed farming, increased production, with standardization and improvement of quality in farm products, together with co-operation in their distribution. A campaign of education in progress to this end has been actively promoted by the Department of Agriculture of Canada, and by the Departments of Agriculture in the several provinces.

That the work done in disseminating information on agricultural topics through these agencies, and the teaching of the agricultural schools and colleges will be productive of good results in the future, is our confident hope. . . .

The general demand for an improvement in conditions of living, arising through the spread of education, has been an important contributory cause to the increase in the cost of living. "You cannot educate people and expect them to live under the old conditions."

If the teaching in the public schools of Canada be supplemented by courses in vocational training, we are firmly convinced that such action on a proper scale will tend to promote and maintain industrial efficiency, and thus serve the best interests of this country.—*Board of Inquiry into Cost of Living.*

THE CONSERVATION OF BREEDING COWS

REPLIES to inquiries instituted as to the extent the farmers and breeders of the country are sacrificing their producing cows would appear to indicate that experience is resulting in remedying improvidence. In other words, information gathered from points extending from one end of the country to another would imply that the value of the female is becoming more realized. Five years ago, the cows and heifers sacrificed to the packers totalled around 45 per cent of the entire killings, but to-day it is nearer 30 per cent, taking the whole country into account and judging from the aggregate of the returns received. This movement is hardly due to any change in the demand for money, for five or six years ago money could be secured on far easier terms than to-day.

While the population has increased up to 1915 by at least 34 per cent, the live stock, that is the convertible stock, has only increased about half that percentage. This means that more people are having to be fed from proportionately a less supply. That farmers have aroused themselves to the situation is proven by the decrease noted in the proportion of females disposed of. The question is, have they realized this very important phase of the subject sufficiently? Are they not still sacrificing too many of their females?

In the belligerent countries this state of things is being recognized far more than it is in Canada. Their produce may be less from the lack of labour and disorganization of the national system, but the fact that, in particular, France and Germany have not only prohibited the exportation of cows, but have ordered a general procedure of breed-

ing, irrespective of all rules of progeniture, shows at once, the value set upon the cow, and the need there is of production. The first year of the war, it was rush for everything. Today, it is production over all. This means that the education of a century will be partly undone abroad, and a breed of worse than grades—mongrels—is likely to be created that will have to be regenerated. That is one aspect of the situation abroad, but there is another, to wit, the meeting of the demand with the supply. When the war comes to an end, millions of men who have ceased to exist will have to be replaced if the normal condition of affairs is to return. With the extent of production necessitated by a prolonged war in European countries, that will take a long time. Consequently Canada, unconsumed by devastation, will have her opportunity, not so much in superabundance of quantity as in excellence of quality. The best will command prices that a few years ago were undreamt of. Every country will need rejuvenation even more than replenishment. How is Canada to play her part in this development? Only by having regard to quality and preserving the best cows.

Having these ideas in view the queries referred to were recently sent out to the large packing houses. The result of this investigation is to prove extreme variety. One packer, for instance, and that the largest, reports that 67 and 68 per cent of his total slaughtering in 1914 and 1915 were cows and heifers. Another of almost equal extent, reports that in his aggregate killings there were less than 30 per cent of cows and heifers, and, as has been said, around this point seems to

range the average for the whole country. The noticeable feature is that the highest percentages are found in the province of Ontario, where three of the largest Toronto firms report that of their total killings, 55 per cent in 1914, and 48 per cent in 1915, were cows and heifers, whereas in the West the three leading firms report that of their killings in 1914, cows and heifers represented 28 per cent, and in 1915 only 26 per cent. This of course would seem to indicate that Ontario was being excelled in wisdom by the West, in so far as there was more sacrificing of the female in that province.

Efforts were made in the inquiry, which was conducted by correspondence, to ascertain what proportion of the females were dried, or worn-out cows, and what proportion were canners, but the records received all indicated that no records had been kept by which this could be estimated even approximately, although the percentage would seem to run from 15 to 25, except in the far West, where the percentage is smaller. Returns were also asked for five or six years back for the purpose of making comparison and arriving at the drift of things. To this request some half dozen firms replied and from these it was ascertained that cows and heifers were represented in the total slaughterings of the last five years by the percentages herewith given:

Year	Percentage
1911.....	43.69
1912.....	36.90
1913.....	37.20
1914.....	36.00
1915.....	30.40

Of the firms represented in the foregoing table two belong to the Toronto district and four to the West, and it is to the West must be credited the greatest preservation and conservation.

The inquiries extended to calves,

but here it was found that no record had been kept of the sexes. The returns, however, showed a tendency to lessening the proportional slaughter, as proven by the following percentages derived from information supplied by the same six firms quoted in the case of cows and heifers:

Year	Percentage
1911	14.70
1912.. .. .	9.10
1913.. .. .	8.00
1914.	7.70
1915.	7.18

That the slaughtering of stock is going on with the same activity in these troublous times as in the years before the war is suggested by the latest reports, and as shown by the Health of Animals Branch returns for January of this year, published on page 280 of this number of THE AGRICULTURAL GAZETTE. Consequently the proportional shortage in increase as compared with the development of population, if not exactly as great as formerly, is of magnitude sufficient to prove, on the one hand, a warning against continued depletion, and, on the other, an encouragement to breeding. That fair percentages of the killings are of worn-out cows is proven by the increases that take place of these grades, particularly in Ontario, in the early winter months. It must also not be overlooked that a certain proportion of the females slaughtered are cows discarded by dairy farmers after having proved themselves unprofitable by tests. It is a question whether or not it would be good business to rescue some of the best of these for the raising of calves from well-bred beef sires. As it is, regarding calves, there is evidence warranting the supposition that the killings are to some extent of inferior breeds, the offspring of cows that it is merely desired to freshen.

PART I

Dominion Department of Agriculture

INFORMATION SUPPLIED BY OFFICIALS OF THE VARIOUS
BRANCHES REPRESENTED

THE EXHIBITION BRANCH

CANADA AT SAN DIEGO

CANADA'S unique exhibit at the Panama-Pacific International Exposition in San Francisco probably received more public attention than any other exhibit at the fair. Up to the very last the building was crowded and the interest well maintained. By this means, and through the United States press, in which more than generous and eulogistic references were made to the Canadian Building and its exhibit, Canada received a splendid advertisement. Before the close of the Panama-Pacific International Exposition a pressing invitation was received from the San Diego Exposition to send the Canadian exhibit down there, as it was

intended to keep that exhibition open for another year. A spacious building was offered free of charge for the housing of the exhibit, with free transportation from San Francisco and free electric current, water, gas and guards. This, of course, constituted an excellent offer and was a direct testimony to the interest and value of our exhibit. It was therefore decided to comply with the proposition and to transfer the exhibit to San Diego, as the cost of maintaining it under the circumstances would not be excessive and a large amount of good, from Canada's point of view, might be expected, in view of the great interest that the exhibit had already aroused.

THE DOMINION EXPERIMENTAL FARMS

THE DIVISION OF ANIMAL HUSBANDRY

A CATTALO HERD ESTABLISHED

THERE has been secured by the Department of Agriculture, through the Experimental Farms Branch, a herd of cattalos—a new race of beef animals produced by crossing the American bison or buffalo with domestic cattle. This herd is the result of a series of exper-

iments carried on by the late Mossom Boyd on his Big Island Stock Farm at Bobcaygeon, Ontario, with the object of producing a strain of beef-producing animals peculiarly suited to the more northern regions of Canada.

The crossing of domestic cattle

with the buffalo has been a matter of experiment for many years. A number of scattered individuals have undertaken it with more or less success. The records of the American Breeders' Association show that, in the late eighties, one Colonel C. J. Jones undertook the crossing of these animals in the state of Kansas. Colonel Jones had lost heavily of cattle from blizzards and undertook to produce a race of animals fit for the production of beef and valuable furs, on millions of acres of land situated beyond the beef raising limit of the country. He is credited with considerable success.

The work has also been undertaken in Texas. Mr. Charles Goodnight succeeded in producing a herd of cattalos, using the blood of the Polled Angus as the cattle side. Mr. Goodnight claims that, in his experience, his cattalos are immune from blackleg, Texas fever, and other cattle diseases and that they reach greater weights, eat less food and hold their flesh better than cattle under adverse conditions. This authority claims that the cattalo does not run from the heel fly nor drift in a storm. In his experience, too, they can exist without water for a longer period than cattle and they are docile, easily broken and never fight.

The experiment carried on by the late Mossom Boyd was commenced in 1894 and continued until the time of his death, some two years ago. At the outset cows of various breeds and crosses were used. Some of these failed to produce and, after several years of experiment, all but grades of the Aberdeen-Angus and Hereford were discontinued. The resulting herd, therefore, possesses the thick form of these beef breeds and a modification of the hump and depth of rib peculiar to the buffalo.

In the early stages of the experiment, sterility was a dominating obstacle to progress, more particularly with the initial cross. With the securing of the true cattalo

—the offspring of parents both of which possess mixed blood—and the elimination of shy breeders, Mr. Boyd developed a herd of prolific animals. Abortions were frequent in the early crosses, but this tendency, also, has been overcome in the cattalo, which compares favourably with ordinary cattle in carrying the young to maturity.

The success of Mr. Boyd's work was, no doubt, assisted by a knowledge of what others had accomplished. Knowing from the experience of others that the initial difficulties incident to these crosses could, with persistence, be overcome, Mr. Boyd pursued his work with confidence and ultimately reached a place that began to show the value of the new breed. After his death, however, it was found that the estate could not further pursue the experiment. From time to time, during recent years, requests have been made to the Department of Agriculture to undertake experiments with these crosses, and when it was learned that the herd of the late Mr. Boyd was likely to be distributed and the value of his work lost, strong representations were made to the Minister of Agriculture to secure the herd of cattalos and to continue the experiment along truly scientific lines.

The Honourable Mr. Burrell, therefore, had the herd thoroughly investigated by officials of the Experimental Farms, the Live Stock and the Health of Animals Branches, and on the results of their findings a selection from the herd was made. The selection consisted of twenty head of the most promising individuals, made up of sixteen females and four males. The females range in age from one to nine years, possess from twenty-five to seventy-five per cent of buffalo blood and weigh from five hundred to seventeen hundred pounds. The males range from four to nine years of age, carry from thirty-one to seventy-five per cent of buffalo blood and weigh from one thousand to two thousand pounds. They are all regular breeders,

so far as they have been tried, and possess every indication of vigour.

It has long been recognized that the buffalo possesses qualities which would be of value if transmitted to beef-producing animals, more particularly for ranging purposes for cold-ridden districts. From the experiments of Mr. Boyd and others it appears that the excellent rustling qualities of the buffalo are retained in the cattalo. During blizzard conditions the cattalo like the buffalo faces the storm rather than drifts before it as is the tendency of domestic cattle.

Furthermore, the cattalo shows excellent grazing qualities, maintaining a plump body even on scant pastures. They carry a further resemblance to the buffalo in rising on their fore feet which enables them to rise when in a weakened condition.

The anatomy of the buffalo is favourable to the carrying of heavy carcasses of beef. They possess an additional pair of ribs as well as much longer spines of the vertebra. Although these extra ribs are not always perpetuated in the cattalo, the length of back persists. Along these

spines very heavy muscles are carried, enabling the animal to carry an exceedingly high percentage of beef on the back, which is the most valuable part of the carcass.

The value of the pelt of the cattalo is also a matter of importance. It possesses many of the qualities of that of the buffalo, but has a better colour, and more lustre, and the hair, which possesses considerable curl, is nearly as long and not matted.

The herd is being wintered on a quarter section of land at the Experimental Station, situated at Scott, Saskatchewan. They are enclosed within an ordinary wire fence; a straw stack provides shelter, and the animals have access to a deep coulee which runs through the quarter section. Although grazing to some extent, they are being given a ration of straw, hay, green-cut oat sheaves and a few roots. With the opening of spring the herd will be moved to more suitable quarters in the foothills of the Rocky Mountains, where this very promising hybridizing work will be continued under favourable conditions.

THE DIVISION OF BOTANY

SCARCITY OF SEED POTATOES

BY H. T. GÜSSOW, DOMINION BOTANIST

THE unfavourable weather conditions prevailing during 1915 in Eastern Canada and parts of the United States encouraged Late Blight and Tuber Rot to do unusual damage, particularly where spraying was not carefully practised. In many instances, we observed 25 per cent losses of the total crop at digging time. In others the losses were less, but in some cases considerably more.

Hence, what seemed in some parts of the country or continent an abundant crop dwindled down to a negligible quantity of very

inferior quality. The high price paid for potatoes for domestic use induced farmers to part with them, and the result will be a grave scarcity of seed potatoes. Already dealers complain about the high prices and the difficulty, amounting almost to an impossibility, of getting reliable seed potatoes at all.

In view of these facts, farmers are warned to make early arrangements for their supply of seed potatoes, unless they are prepared to pay \$3 and more per bushel. Those who have still a supply of potatoes are advised to immediately reserve a

quantity for their own seed purposes, and to make known to dealers if they have a surplus of a good class potato suitable for seed. These potatoes should all be hand-selected tubers, sound and free from bruises and decay, of uniform size and pure in variety. Tubers slightly larger than a hen's egg are most economic for seed purposes. They should be kept until planting time in a dark, well-ventilated and cool place of storage, spread out in a layer not more than three potatoes deep.

There can be little doubt that farmers who have a good quantity of sound seed potatoes on hand will obtain a high price for them, when others begin to realize the scarcity. The lesson to be learned from this present difficulty is not to trust that the crop will be "all right" but to avoid similar losses next season by paying attention to the prevention of diseases. For this purpose consult Farmer's Circular No. 9 on the control of potato diseases, issued by the Central Experimental Farm, Ottawa.

PLANT DISEASES vs. NATIONAL WEALTH

BY H. T. GÜSSOW, DOMINION BOTANIST

FROM time immemorial there has been a close interdependence between national wealth and agricultural production. Especially in a young country like Canada will the national wealth be more readily responsive to agricultural fluctuations than to those of other productive concerns. This mutual relationship in adversity and prosperity stands out most clearly whenever there occur a series of lean harvests, or of crops more than usually abundant. Hence, if our aim at the present juncture be, as it ought, the maintenance and enhancement of our national wealth, the surest mode of attaining a speedy response to co-ordinated efforts will be along the lines of farming practices. And among the most essential methods of maintaining profitable returns from farming are co-operative efforts directed against waste and losses due to inferior farming practices, to seasonal mishaps, or to crop-reducing plant diseases.

It seems curious that the individual farmer should lose sight of the immense amount of waste of national wealth caused by negligence or indifference towards control of plant diseases. Numerous instances might be quoted which would show that plant diseases cause a sur-

prisingly large economic loss every year. These losses, while affecting the individual more or less heavily, yet are so cumulative that, when considered as a whole, the tribute exacted by these diseases from the returns of profitable farming amounts to a sum of money—that is, a reduction of national wealth—of an astounding total.

Why do so many farmers look upon plant diseases as something chronic in occurrence, something they must put up with, as a scourge from on High, instead of foes to be fought and overcome, and even braggart enemies often enough at that? Why should they neglect in their warfare the elementary out-post precautions, which would save them against surprise and disaster in the later stages of their yearly campaign?

For example, there is a potato disease known by the name of Black Leg. It is a destructive disease and so easily propagated as not only to wipe out all profits from potato raising, but to cause crop losses up to 80 per cent of the total yield, as has been actually determined right here in Canada. Only recently, we have estimated the losses from this disease for the three Maritime Provinces to have amounted to nearly \$700,000 during 1915. Now

individual effort and at the cost of a fraction of a dollar individually the losses due to Black Leg could have been averted absolutely.

Late Blight with the accompanying Potato Rot—another destructive and injurious disease—causes in certain years considerably heavier losses. It is estimated that last season the loss in yield in Prince Edward Island was probably not less than 2,000,000 bushels. The damage all over Eastern Canada including Ontario has been on the same or even a heavier scale. The argument that the unfavourable weather conditions had much to do with these great losses last season no doubt holds good, but only to a limited extent, since it was proven in the same season that, where potatoes had been carefully sprayed to prevent this disease, the yield was above the average of good years, and the crop sound.

When will farmers learn the lesson long ago learned by the successful business man, viz., to economize where economy would yield returns and profits? It is not economy, but sheer waste, to neglect the most elementary and simple methods directed towards the control of plant disease. But it is true that farmers, for some reason or other, neglect to take precautionary measures to prevent damages to their crops which are more likely to result than not. The unfortunate fact that the parasitic diseases are not as plainly visible as a ferocious animal accounts for much of the damage which they cause every year. The invisible foe is always the most dangerous, because difficult to realize.

DISEASES OF FIELD AND GARDEN

Take another example—the smut diseases of grain. Last year, I had occasion to walk through a field of oats so badly smutted that my clothes were all covered as if with soot. The farmer confessed he had

never treated his oats, and did not think smut would be so bad next year. I spent considerable time explaining to him the life history of this disease; he promised to treat his grain next year; but when the time comes will he really do it? The Department of Agriculture of the Dominion of Canada is doing its utmost for the farmers. Every man in the agricultural service is at the disposal of the farmer, and individually the Department has saved thousands of dollars of losses to farmers.

In the grain-growing provinces the treatment of grain is universally practised. The losses from smut would otherwise be enormous. And yet in the east the farmers are still indifferent towards adopting this simple method of treatment which would yield at once so satisfactory profits.

Club Root of turnips, cabbage, etc., is another disease causing great losses. Indeed, on many farms these crops can no longer be raised profitably and are now no longer raised. The result is that the prices of these commodities go up quickly and become prohibitive. The consumer cannot afford to pay the high prices, and farmers, who still raise the crop, find it often thrown on their hands. The beneficial effect of lime on severely contaminated land has been demonstrated times without number. The effect of drainage, the selection of land and of resistant varieties have already shown that the disease is controllable.

ORCHARD DISEASES

Among the orchard diseases, Apple Scab is the most important. Scabby apples can never be sold as grade No. 1. The difference in selling price between grades No. 1 and No. 2 is often so great, that the production of No. 1 grade would soon pay for the expenses of practising recognized measures of control.

The plant disease experts are continuously on the look-out to

protect the farmers from losses due to diseases. Some years ago Canada was threatened with an invasion by Potato Canker, an European disease, which is now only found in the Colony of Newfoundland, but which would have surely established itself on the Continent of America had the disease not been recognized at once, and had the Department not taken the most vigorous steps to prevent its introduction here. At the present moment Canada is quite free from this disease, and it is the duty of the Plant Pathologist to keep it free.

There is, however, no single agricultural crop raised in the Dominion that is not subject to one or more destructive diseases which are already established. An estimate of the total losses due to these diseases for the whole Dominion is not possible, but, generally speaking, at least 15 per cent of the total crops produced are destroyed by disease.

A farmer who desires to grow a new crop of any kind enquires as to the method of cultivation and the mode of harvesting, and often neglects the important factor concerning the demand for his produce.

He, however, always neglects the disease factor. How much flax grown will be grown in the future in Canada, nobody can say, but if farmers neglect from the commencement the treatment of every pound of flax seed sown a disease like Flax Wilt will become so rampant that it will soon make the industry unprofitable.

The above remarks are made to bring the farmer's attention once more to the losses arising from disease. There can be no question that the farmer who, by superior knowledge and experience, raises the largest crops on the smallest area, will more quickly become well-to-do than the man who only secures under-average yields. Increased agricultural production—not necessarily through an increase of area—but due to up-to-date farming methods, which must include the prevention of disease losses, will produce the most marked difference in the well-being of our country, and co-operative efforts to eliminate the losses from diseases will make more stable than ever the finances of the country and increase the national wealth of Canada.

THE DIVISION OF FORAGE PLANTS

THE INOCULATION OF ALFALFA

BY M. O. MALTE, PH.D., DOMINION AGROSTOLOGIST

LEGUMINOUS plants have, as is well known, the faculty of live and thrive in soil destitute of nitrogenous elements. This ability is due to the presence in the soil of certain bacteria which live in a kind of association with the plants. Through the bacteria, the leguminous plants are being supplied, indirectly, with nitrogenous food, originating from the free nitrogen of the air circulating in the soil.

It is also well known that, a great number of species of legume bacteria

exist and, furthermore, that each species is able to associate itself with only one or a few species of legumes. Thus, for instance, the red clover bacteria are not able to associate themselves with alfalfa and, *vice versa*, the alfalfa bacteria are not able to live on red clover.

As practical experience has shown that the bacteria are necessary for a healthy and lasting stand of alfalfa, it follows that one of the essentials for successful alfalfa growing is the presence in the soil of the specific

bacteria. In this connection it may be stated, that the alfalfa bacteria seem to be identical with those living on sweet clover.

If the bacteria in question are not present in the soil in sufficient numbers to ensure a good stand of alfalfa from the start they should be introduced artificially. In other terms the alfalfa should be inoculated.

Inoculation is necessary, or at least advisable, in any case where alfalfa is being started on virgin soil, that is to say, on land which has not grown alfalfa before. The advisability of inoculation on such land has been amply demonstrated by numerous experiments in different parts of the Dominion.

Whether soil inoculation or seed inoculation is to be preferred is more a matter of convenience, both methods having proven satisfactory.

Through the Experimental Farms' system large quantities of soil for inoculation have been distributed during the past years, especially from the Central Experimental Farm, Ottawa, Experimental Farm, Brandon, Man., Experimental Farm, Indian Head, Sask., Experimental Station, Lethbridge, Alta., and Experimental Station, Lacombe, Alta. The soil is being distributed free of charge, except for the freight.

Up to the present, nitroculture for inoculation of the seed has not been manufactured by the Experimental Farms. This year, however, arrangements have been made to produce it at the Central Experimental Farm, Ottawa. The nitroculture will be sent free of charge upon application to the Dominion Botanist. Each sample will be accompanied by directions as to its use.

THE LATE ARTHUR C. SHUTTLEWORTH

Dr. Arthur C. Shuttleworth, whose death was announced in the February number of THE AGRICULTURAL GAZETTE, was born on a farm in York county, Ontario. He entered the Ontario Agricultural College in 1880, took his associate diploma two years later, and in 1885 entered McGill University, graduating from there in science in 1889. From then until 1891 he lectured in Chemistry in Prince of Wales College at Charlottetown, P.E.I. Dr. Shuttleworth next succeeded Dr. C. C. James as Professor of Chemistry at the Ontario Agricultural College, where he remained for twelve years. He then studied at the University of Göttingen, in Germany, for two years, where he secured the degree of Ph.D. On his return to Canada he received an appointment with a beet sugar manufacturing company at Berlin, where he had charge of the chemical laboratory. After filling this position for about three years he took up farming, operating with success a 360-acre farm near Guelph. Five years later he purchased and settled upon a 640-acre farm at High River, Alberta, known as the Mountain View Stock Farm, which he occupied until the time of his death, and which is now being operated under the name and title of A. C. Shuttleworth & Sons. The deceased always took a keen interest in agriculture, especially in live stock, and was a moving spirit in the local association of the United Farmers of Alberta.

THE ENTOMOLOGICAL BRANCH

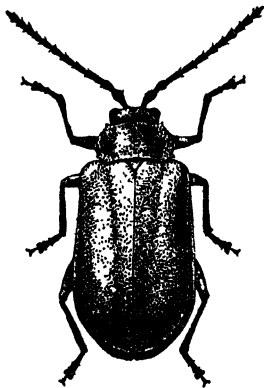
INJURIOUS SHADE TREE INSECTS OF THE CANADIAN PRAIRIES

BY J. M. SWAINE, ASSISTANT ENTOMOLOGIST IN CHARGE OF FOREST INSECT INVESTIGATIONS

THE Manitoba maples, cottonwoods, poplars and willows, so widely utilized in our prairie provinces for shade and shelter belts, are, unfortunately, subject to attacks by very injurious insect enemies. During the past summer such outbreaks of shade tree insects were unusually severe over a large part of the three provinces.

POPLAR AND WILLOW LEAF BEETLES

The poplars and willows are frequently attacked by several species of leaf-eating beetles.



THE WESTERN WILLOW LEAF BEETLE,
GALERUCELLA DECORA SAY., GREATLY
ENLARGED

(After Chittenden, U.S. Dept. of Agriculture)

The Western Willow Leaf-beetle, *Galerucella decora* Say, is a small dark-yellow or brownish beetle, rather flat and about three-sixteenths of an inch in length. Both adults and larvæ feed upon the leaves of willows and poplars, stripping off the green surface, more or less com-

pletely destroying the foliage, and leaving the trees scorched and brown. Many trees were killed last summer in badly infested districts in the provinces of Alberta and Saskatchewan. The adult beetles hibernate beneath the fallen leaves and are ready in the spring to attack the young foliage.

The Straked Cottonwood Leaf-beetle, *Lina scripta*, the Unspotted Aspen Leaf-beetle, *Lina tremulæ*, and several allied species, have similar habits and frequently defoliate poplars and willows more or less completely. *Lina scripta* and a closely allied species, *Lina interrupta*, seriously injured wind-breaks of willows last summer in the provinces of Saskatchewan and Alberta.



THE STRAKED COTTONWOOD LEAF
BEETLE, *LINA SCRIPTA*

a, Normal Form; b, c, d, e, Variations
(After Riley, U.S. Bureau of Entomology)

Control Measures

All such leaf-feeding species on poplars and willows are effectively controlled by spraying the infested foliage with arsenate of lead or Paris green early in the season, as soon as the beetles appear, and again, if necessary, about ten days later.

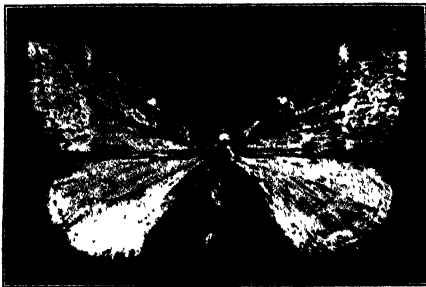
CANKERWORMS

The Fall cankerworm, *Alsophila pometaria* Harris, has been particularly injurious to Manitoba maples



WORK OF THE STREAKED COTTONWOOD LEAF BEETLE
LINA SCRIPTA FAB. (After Riley, U.S. Bureau of Entomology)

in the provinces of Manitoba and Saskatchewan during the seasons of 1914 and 1915. The adults of these small caterpillars are brownish-gray moths about one-half an inch long. The males have thin delicate wings; but the females are wingless and must crawl up the tree trunks to deposit their eggs.



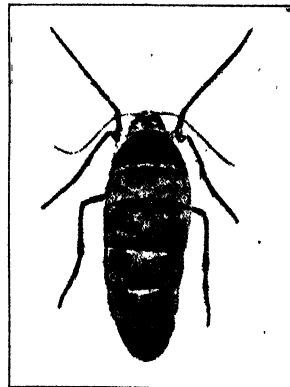
FALL CANKERWORM, MALE MOTH, TWICE
ENLARGED
(After Slingerland and Crosby)

When the caterpillars become full grown they descend to the ground on a thread of silk and bury themselves below the surface; there they change first to the pupa, or resting-stage, and later to the adult, or moth. The latter usually appears in the fall, and the wingless females ascend the trunks to deposit their eggs upon the bark of the branches and twigs. The eggs hatch late in April, or in May, and the caterpillars feed upon

the foliage for about a month, becoming about an inch in length when full grown. When the caterpillars are very numerous they are able to defoliate the trees entirely and to cause serious injury.

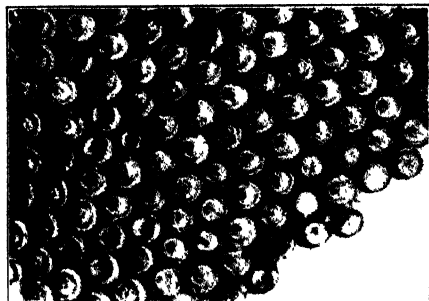
The moth of the Spring cankerworm, *Paleacrita vernata* Pack., emerges from the ground and deposits its eggs upon the bark in small clusters during the

first warm days of early spring. That of fall cankerworm, which is the most abundant and injurious species in Manitoba, emerges from the ground in large numbers during the latter half of October and deposits its eggs upon the bark of branches and twigs in clusters of from 100 to 400. The eggs remain upon the trees during the winter and hatch in the spring. The cankerworms are slender, greenish, yellowish or blackish caterpillars, about one inch long when full grown, light green below and with one yellow and three narrow white stripes along the sides. The legs of cankerworms are at the front and hind ends of the slender



FALL CANKERWORM, FEMALE MOTH, EN-
LARGED TWO AND ONE-HALF TIMES
(After Slingerland and Crosby)

body, and the resulting "looping" method of locomotion has given them the common name of "measuring-worms." The spring cankerworm has two pairs and the fall cankerworm three pairs of prolegs at the hind end of the abdomen.



PORTION OF AN EGG-MASS OF THE FALL
CANKERWORM, GREATLY ENLARGED
(After Slingerland and Crosby)

Remedial Measures

Cankerworms may be controlled either by banding the trees with a sticky substance to prevent the wingless females crawling up the trunks to deposit their eggs, or by spraying the infested foliage with poison while the caterpillars are small.

Spraying with Arsenates. The infested trees should be sprayed with "Paris green" or with lead arsenate as soon as the caterpillars appear so as to poison the latter before they do much injury. After the cankerworms are half-grown it is more difficult to kill them with poison.

Lead arsenate is the most satisfactory spray mixture for this purpose. It should be used at the rate of 4 to 5 pounds in 100 gallons of water; the stronger mixture is used when the caterpillars are more than one-half an inch long.

Paris green may be used instead of the lead arsenate at the rate of 1 pound mixed in 100 gallons of water. To avoid burning the foliage one pound of freshly slaked lime must be added to the mixture for each pound of Paris green used.

The first application should be made as soon as the caterpillars appear on the leaves, probably early in May. A later spraying may be necessary, particularly if heavy rains follow the first application. Apple trees should be sprayed just before the blossoms open and again just after the blossom petals drop. The spray should be carefully applied and all the leaves thoroughly covered.

Banding. When cankerworms have been abundant in a district and a recurrence of the injury is to be expected the following season, valuable trees may be protected from injury by applying a sticky band about the trunk to prevent the wingless females crawling up to deposit their eggs



FALL CANKERWORMS
(After Slingerland and Crosby)

upon the branches. A strip of thick wrapping paper is tied about the trunk with two strings five or six feet from the ground, and to this the sticky substance is applied in a complete ring about five inches wide. An excellent sticky mixture is made

by boiling together equal parts of resin and castor oil. Even the common sticky fly papers may be used effectively. To be effective the sticky bands must be applied during the second week in October, before the females begin ovipositing, and must be kept fresh until the ground is frozen.

PLANT LICE ON THE MANITOBA MAPLE

The Negundo Plant louse, *Chaitophorus negundinus* Thos., a small green plant louse, is the most persistent and serious enemy of the manitoba maples in the prairie Provinces. The insects appear in enormous numbers early in the season and suck the juice from the foliage, killing many of the younger leaves, deforming many others, and through a copious exudation of a fluid known as *honey dew* inducing the rapid development of a *black sooty fungus* which covers and seriously disfigures the foliage. In bad infestations there is considerable defoliation, especially of the partly developed leaves. Usually the many insect enemies of the pest so reduce its numbers that the trees may develop normally through the latter half of the season.

Control Measures

Plant lice obtain their food by sucking the plant juices through a slender beak embedded in the tissue. Poison sprays are, therefore, ineffective. They are controlled by spraying with an insecticide which kills by contact. Such contact insecticides are: kerosene emulsion, fish oil or whale oil soap, and the nicotine extracts. Kerosene emulsion, diluted one to nine, is often most readily obtained, and is entirely effective if thoroughly applied as soon as the insects become numerous. In some seasons, later sprayings are necessary.

A TWIG-BORER OF THE MANITOBA MAPLE

The Negundo Twig-borer, *Proteopteryx willingana* Kearf., is more

or less injurious each season to twigs of the Manitoba maple. The injury is caused by the caterpillar of this small moth boring into the young twigs, causing them to develop into elongated hollow galls within which the caterpillar lives and feeds, extruding the excrement through a hole in the side. Many twigs and even small branches may be badly stunted or killed, and when the caterpillars are numerous, the injury, particularly to small trees, is often considerable. The caterpillars become full grown during June, and pupate either in ground below the trees or, infrequently, within the galled twigs. The adult moths emerge from the pupal cases during July. The young caterpillars are said to feed upon the leaves for a short time before entering the twigs.

Control Measures

The only remedy that has been suggested is to collect and burn the infested twigs early in June to check the spread of the injury. This method obviously has a very limited application, but may be employed to check the trouble on small trees. It is possible that a spray of Paris green or lead arsenate applied about the end of June would destroy many of the young caterpillars.

A WOOD BORER IN POPLARS

The Poplar Borer, *Saperda calcarata*, is a common and destructive enemy to all kinds of poplars. Rough, blackened scars and swollen areas on the trunk and branches, with large tunnels piercing the wood beneath are evidences of its work.

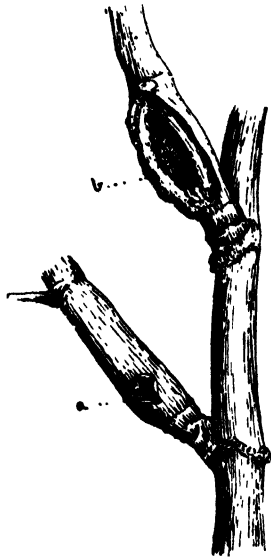
The adult insect is a handsome beetle, an inch and a quarter long, of a grayish colour marked with yellow, or more rarely entirely brownish. The eggs are laid in the bark of poplars during the latter part of the summer. The whitish grubs feed first in the inner bark, and then bore into the wood below; they attain a length of two inches when full grown and excavate large irregular

tunnels through the sap-wood and heart-wood. The tunnels are often betrayed by the castings extruded from openings in the bark.

Infested trees of little value should be removed and burned before June. Valuable trees may be saved by cutting out the boring grubs in the early fall, or by killing them with benzine or carbon bisulphide injected in small quantity into the borings and retained by a plug of clay or putty.

A TROUBLESOME VISITOR IN HOUSES

The Box Elder Plant Bug, *Leptocoris trivittatus* Say, an elongate black bug decorated with red markings, is often found congregating in



WORK OF THE BOX ELDER TWIG BORER

(After Washburn)

immense numbers about houses and out-buildings in the warm days of the late fall. Aside from the annoyance caused by their presence these insects are quite harmless to man. During the early season they breed upon the foliage of the Manitoba maple and other trees, and are seldom very conspicuous. The gre-

garious habit appears only during the latter half of the summer.

When the bugs are congregated in dense masses on tree trunks, the sides of buildings, or similar places, they may be destroyed with boiling water or by spraying them with kerosene. They are most effectively kept from dwelling houses by suitable screens upon the windows and doors.

SPRAYING SHADE TREES

For the application of sprays a spray pump of some sort is, of course, necessary. A power sprayer is needed to cover very high trees, but for most trees of the prairies a spray pump of almost any sort, fitted with proper hose and an extension nozzle will do very effective work. A barrel pump, or even the half-barrel size, will spray small trees, even the very cheap bucket-pumps and knap-sack sprayers may be used with astonishing effect. These spray pumps can be obtained through the local hardware merchant. Such a method of protection can, of course, only be profitably applied to ornamental and shade trees, and to wind-breaks valuable enough to warrant the expenditure of a few cents per tree.

Lead arsenate. Leaf-feeding insects of all kinds are usually best controlled by poison sprays. Lead arsenate is one of the best of these for use on shade-trees; its initial cost is somewhat higher, but it adheres to the foliage longer, and does not often burn the leaves when used at the ordinary strength. It is usually sold in the form of a paste, and should be worked up in a small amount of water before being diluted. For general spraying against leaf-feeding insects, two pounds are mixed with 40 gallons of water; but for bad infestations of cankerworms, especially when the caterpillars are more than one-half grown, three or four pounds to the barrel of water should be employed.

Lead arsenate is also used in the form of a powder. One pound of the powder will do the work of about two pounds of the paste.

For use in small quantities:

Lead arsenate,	1 tablespoonful.
Water,	1 gallon.

Paris green is used at the rate of four ounces mixed in 40 gallons of water for general spraying against leaf-feeding insects. When a stronger mixture is required the poison may be increased to five ounces in 40 gallons. There must always be added at least as much freshly slacked lime as *Paris green* to prevent burning the foliage, and the spray mixture must be kept well stirred while spraying is in operation.

Paris green,	4-5 ounces.
Fresh lime,	$\frac{1}{2}$ -1 lb.
Water,	40 gallons.
For use in small quantities:	
Paris green,	1 heaping teaspoonful.
Mixed in Water,	3 gallons.
Freshly slaked lime	3 ounces.

Kerosene or Coal Oil Emulsion:

A very effective spray mixture for the control of plant lice, and other sucking insects. It must wet the insects in order to affect them, therefore the application should be thorough.

One-half pound of hard soap is shaved fine into one gallon of hot water and stirred until dissolved. Two gallons of kerosene (coal oil)

are then added and the mixture immediately churned violently, until a thick creamy emulsion is produced. This churning is best done with a bucket pump, putting the nozzle back into the bucket. The stock emulsion which is obtained when the mixture is properly made will keep for months if covered from the air. For use on plant foliage it must be diluted with water at the rate of one part of the stock solution well mixed in from 9 to 12 parts of soft water.

Stock Emulsion:

Laundry soap,	$\frac{1}{2}$ pound.
Soft water (hot),	1 gallon.
Kerosene (coal oil),	2 gallons.

Diluted Spray:

Stock solution,	1 gallon.
Water, 9 to 12 gallons as required.	

Whale-oil or Fish-oil Soap is used for the same purpose as kerosene emulsion. It may be employed against plant lice at the rate of one pound dissolved in from four to six gallons of water. Its unpleasant odour makes this insecticide less desirable for use on shade trees.

Tobacco Extracts. Several valuable preparations of nicotine may be obtained from dealers in insecticides. "Nikoteen" and "Black Leaf 40" are among the best of these, and are very effective in controlling plant lice. Soap should always be added to the diluted spray at the rate of about one pound to forty gallons.

The school-garden idea is getting a firm foothold. Upwards of twenty gardens were in operation in this district during the year. The study of elementary science, in so far as it relates to agriculture, should form a very especial part of the science-work in our country schools. I look for marked advance in the number and excellence of school gardens to follow the excellent special course given in Victoria during the summer vacation. Teachers who have had no special training can do something, however. A few flowers in the window, a tree or a garden-plot in the yard, will serve as a beginning. To tend sympathetically a few plants, to supply their needs from day to day, and to learn to look upon plants as living things, each with a life-history, can scarcely fail to leave a lasting impression upon the minds of children.—J. B. DeLong, Inspector of Schools, British Columbia.

THE DAIRY AND COLD STORAGE BRANCH

CONFERENCE OF DAIRY RECORDERS

INSTEAD of holding one general session for all the thirty-five recorders who are supervising the cow-testing work in their several localities, it was decided this year to hold three separate conferences for the three natural divisions of the work.

Accordingly the men in the Maritime Provinces met at Amherst, N.S., on December 7th, during the winter fair, the Ontario men met on January 18th, at Ottawa, also during the winter fair, while the French speaking recorders of Quebec met on

January 27th, during the seed fair in the city of Quebec. These meetings were also attended by the superintendents of the three groups, the chief of the dairy division, while at Ottawa the Dairy Commissioner also attended one session of the conference.

A general survey of the work was taken, a few minor changes in some details were proposed, but good plans were made for making all cow-testing more effective and widespread in each district.

SPREAD OF COW-TESTING ASSOCIATIONS

Largely as a result of the excellent opportunities offered by the short courses recently held in the province of Quebec, six new cow-testing associations have been duly organized, at Trois Pistoles, Notre Dame du Lac, St. Germain de Grantham, Victoriaville, Isle Verte and St. Gregoire, with about 800 cows entered. The dairy division is forwarding supplies of acid and preservative tablets so that milk samples may be tested as soon as the cows freshen. It is being ar-

ranged to do the testing at the local factories with occasional supervision by superintendent for the province.

From Western Ontario one or two factory owners have already written the dairy division stating they expect several patrons to take up cow-testing. In connection with the dairy record centres, arrangements are in progress for each recorder to take in one or more outlying factories in his district, and help the makers to organize the patrons for regular weighing and sampling.

HIGH COST OF RENNET EXTRACT

CCHEESEMAKERS are being asked very high prices for supplies of rennet extract for the coming season, and it would appear that there is some danger of a shortage even at the great advance in cost. The reason for this shortage, (See page 214, THE AGRICULTURAL GAZETTE, for March, 1915), is due to the fact that the great bulk of the raw rennets have been secured in recent years from

European countries now at war.

Cheese manufacturers would do well to encourage the patrons of factories to save the rennets from calves which are slaughtered before they are given solid food of any kind.

A circular on the subject giving directions for the saving of the rennets and for the preparation of home-made extract is now available for distribution.

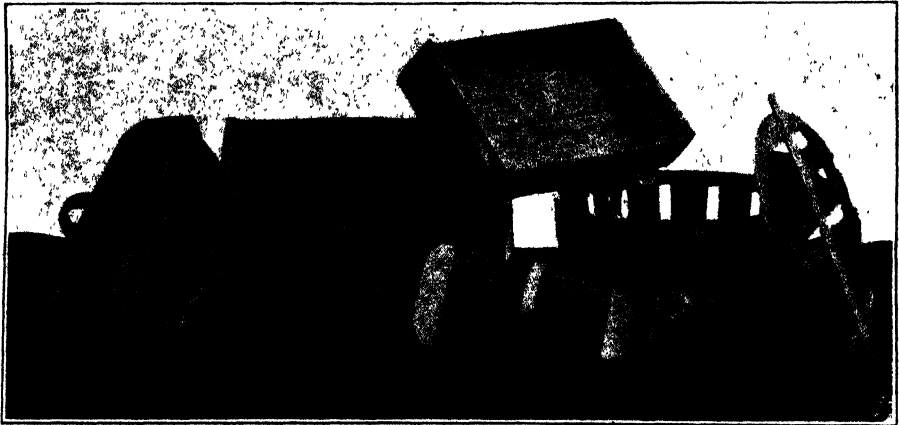
PEACH PACKAGE TESTS—SEASON OF 1915

BY J. M. CREELMAN, B.S.A., ASSISTANT, GRIMSBY PRECOOLING AND COLD STORAGE PLANT

THE experience of some growers and shippers in Ontario has shown that peaches may be successfully shipped long distances. Reports from consumers indicate that peaches from Ontario arrive after long shipments in a good or bad condition, depending upon the type of package used and the care used in packing and shipping. Generally speaking, opinions at the distributing points have severely criticized Ontario's peach packing in the past. It is often said in Manitoba that the consumer can expect to discard one tier of Ontario peaches when they are shipped in the 11-quart Climax basket, while the 6-quart basket renders many bruised and decayed in carload shipments.

during the past season, demonstrating principally the use of the standard peach box of the Northwest. Boxes were purchased in shook form, thus saving freight, a nail stripper and nailing bench were installed and the boxes were made up the same as is universally done in the packing houses of the Northwest.

With the arrival of the peach-packing season girls were employed and taught the proper methods of packing, becoming proficient after a few days' practice. Shippers desiring to ship to the prairies brought their peaches to the warehouse for packing, the Department packers taking entire charge of the consignment thereafter, charging the shipper for the service. As soon as packed the



GROUP OF PEACH PACKAGES INCLUDING 6-QUART AND 11-QUART CLIMAX BASKETS, WOOLVERTON CRATE, MICHIGAN BUSHEL BASKET AND THE STANDARD PEACH BOX

In view of these facts it was decided to demonstrate the peach packages and packing that have proven successful for long distance shipments, otherwise the benefits derived from precooling would be vitiated by poor packing methods. A model packing room was operated

peaches went into the precooling rooms.

In order to show returns from peaches shipped in various packages, and also determine the waste in the various packages two carload shipments were made to Winnipeg, Man. The following packages were used:

1. Northwest standard box.
2. Woolverton crate (3-6 qt. heaped baskets).
3. Hunter Crate (6-6 qt. heaped baskets or 4-11 qt. heaped baskets).
4. Michigan bushel basket.

The Northwest standard box for peaches has the following inside dimensions, 18 by 11 by 4½ inches. The depth varies from 4 to 5 inches, depending upon the size and shape of the peaches to be packed. The sides of the box are slightly narrower than its depth, and the tops and bottoms are made of thin material narrower than the box, thus giving quarter-inch cracks for ventilation and sufficient spring for bulge. The tops and bottoms are put on with cleats, to protect the bulge, for ventilation and security. Cleats are very essential on the peach box.

The Woolverton crate is designed to carry three 6-quart, heaped Climax

baskets, these being covered with leno.

The Hunter crate is designed to carry six 6-quart baskets or four 11-quart baskets, packed in the same manner as the Woolverton crate.

The Michigan bushel basket is a splint bushel basket with lid and centre post, commonly used in Michigan, Western Ontario and New York.

Mr. A. H. Flack, Chief Fruit Inspector of the Prairie provinces, inspected the cars and packages. The time elapsing between shipping and opening the cars in Winnipeg was seven and five days respectively. All lots of peaches were in good condition, showing no waste. This is undoubtedly due to the fact that the fruit was picked at the proper degree of maturity and was precooled directly after packing.

RESULT OF SALES

PACKAGE	Net Weight of Fruit	Cost of Pkge. and Packing		Average Sale Price	Average Net Returns to Growers	
		Total	Per Lb.		Per Pkge.	Per Lb.
	Lb.	c.	c.	\$	\$	c.
Northwest standard box, Early Crawford lot.....	20	15	0.75	0 87½	0.392	1.96
Northwest standard box, Elberta lot.....	20	15	0.75	0 53½	0.113	0.56
Woolverton crate (three 6-qt. baskets).....	27	26	0.96	2.03½	1.146	4.23
Woolverton crate, 2nd lot.....	27	26	0.96	1.174	0.425	1.58
Hunter crate (six 6-qt. baskets)...	54	51	0.94	4.003	2.83	4.14
Michigan bushel.....	56	17¾	0.31	0.716	0.053	0.94

Crates occupy so much space that 20,000 lb. cannot be put in a car when they are shipped alone, so that in straight carloads of crates the freight expense would be more, and the net returns less than those shown above. From 480 to 560 Woolverton crates may be loaded in a car, making their weight for freight expenses range from 36 to 41.6 lb. About 240 Hunter crates may be loaded in a car, making their weight for freight expenses amount to 83.3 lb.

THE NORTHWEST STANDARD BOX

For western markets and select trade in eastern markets the 20 lb. box is the most satisfactory peach package. As a carrier of fruit when well packed it is not to be equalled. For long distance shipments it is rivalled only by the Georgia carrier. The latter is slightly cheaper in original cost and cost of packing (0.5c. per pound), but the wrapping of the fruit in the box means days to the life of the peaches by preventing

bruising and isolating fruits that start to decay prematurely. Western wholesale houses are very reluctant to make f.o.b. purchases of any other type of peach package.

New packers may be taught in a short time to pack in boxes and with a few days' practice most packers become proficient. Packers will pack from 70 to 120 boxes per day. The cost of package, packing and nailing is 0.75c. per pound of fruit.

THE WOOLVERTON CRATE

The Woolverton crate is a new package built to protect peaches marketed in baskets and to allow the marketing of the popular "leno" or heaped baskets. For local express shipments it is an ideal package as it carries peaches well, is not easily pilfered, and is a good display package. For long distance shipments it carries peaches well, but on account of the space it requires it is not adapted to carload shipments, since sufficient packages cannot be loaded to make up the minimum weight. The package is to be criticized for long distance shipments on account of the liability of the fruit to bruise by its jarring about in the baskets.

It is a package that can easily be adopted by the growers since they are accustomed to marketing in the Climax baskets. Its initial cost and for packing is slightly more than that of the box, being 0.96c. per lb. From general observations during the season it is evident that this package will readily wholesale for from \$1.25 to \$1.75 in the prairie markets, netting the grower from 1½ to 3c. per pound for his fruit.

THE HUNTER CRATE

What has been said about the Woolverton crate also applies to the Hunter crate. Its chief advantage over the Woolverton crate is its lower cost, although it is less attractive and not so well loaded in cars nor as easily handled.

While the net returns in this trial were 4.14c. per pound, this would be more than the average. The freight was also figured on the actual weight of the package rather than on the straight carload basis.



THE HUNTER CRATE

To hold four 11-quart or six 6-quart Leno baskets.
Size of basket 22 by 16¾ by 21¾ inches

THE MICHIGAN BUSHEL BASKET

This package was used to determine how western markets would accept a large-sized package in purchasing peaches for preserving. Its chief advantages to the grower would be its cheapness and the quickness with which it may be handled.

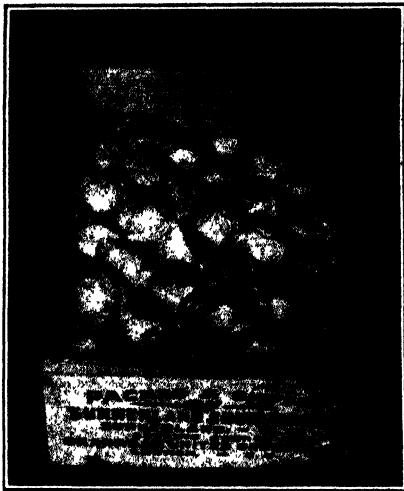
The bushel was found very difficult to sell in Winnipeg, the net returns being less than the cost of the package, the grower having to pay, besides his fruit, 0.9c. per pound. The bushel holds too great a bulk to make an ideal peach package and it is not advisable to educate markets to accept it.

PACKAGES ADAPTED TO CAR LOADING

The standard northwest box is undoubtedly the most satisfactory package for carloading. It is the most economical in the use of space.

Spaces between packages may be readily left for ventilating and refrigerating purposes. The minimum weight may be loaded in the car without piling to the roof of the car. The load can be securely "squeezed" and braced without injuring the packages of fruit.

The Woolverton crate and Hunter crate may be loaded in cars securely without danger of injury to the fruit, as is the case with baskets alone. They are especially well adapted to refrigeration and ventilation. Their great disadvantage in carloading is



STANDARD PEACH BOX SHOWING DIAGONAL PACK AND WRAPPING

the large amount of space they require. In order to load 560 Woolverton crates in a car it is necessary to stack them to the roof, whereas the Hunter crate is even less economical of space. Unless very good prices are to be secured it would be advisable to ship these packages in mixed cars when the minimum weight could be made up with less spacious packages of fruit.

The bushel basket is readily loaded in a car, securing the minimum weight

with four tiers high. Centre posts in the basket prevent excessive bruising of the fruit. The bushel basket is not advantageously loaded in cars of mixed packages.

CONCLUSIONS

1. Peaches may be shipped without waste to prairie markets in packages other than the box if properly picked, packed and precooled.

2. Competitors in western markets use the box, a package which wholesalers, jobbers and retailers prefer over every other package. In shipping Ontario peaches it is essential to meet this competition with a package that is as good or better.

3. Packages costing the least do not always mean a saving since the more expensive packages made the greatest net returns. The Woolverton crate, costing the most, made the greatest net returns. The more expensive packages are to be advised for long distance shipments if they are such that carry the fruit without waste.

4. The Northwest standard box is the most satisfactory package for carloads of peaches shipped long distances. Returns will average as much or more as with other packages and there is a greater assurance against waste.

5. The Woolverton and Hunter crates are well adapted for shipping the heaped leno basket. As safe carriers of fruit they are more easily adapted to Ontario conditions than the western box, and, although costing more, will undoubtedly make greater net returns in eastern markets. This would not prove true with western shipments if based on a large number of trials.

6. The bushel basket for marketing peaches is not adapted to western markets.

THE SEED BRANCH

NEW CONTROL SYSTEM FOR MARKETING SEED CORN IN THE EAR

BY GEORGE H. CLARK, B.S.A., SEED COMMISSIONER

IT is especially important this spring that ensilage growers be very careful in procuring their seed corn. Owing to the unusually wet weather which prevailed last fall, good seed corn which is well matured, thoroughly dried and strong in vitality, is exceptionally difficult to secure. The supplies of seed corn both in the United States and Ontario are considerably below normal in both quality and quantity.

In order to make the best use possible of the Ontario-grown corn which is available for seed this year, and to put the trade in seed corn in the ear on a better basis, a new system for marketing under control has been inaugurated. The object is to protect the purchaser who wishes to buy, and is willing to pay for, specially cared for seed against being supplied with inferior quality at a high price, and at the same time to protect the growers who put reliable seed on the market, and guarantee its quality under definite standards against competition with ordinary feed corn represented as seed.

The regulations under which "controlled" seed corn is to be marketed will be found in the agreement printed below. The system is entirely voluntary. Any grower who has good seed corn for sale may sign the following agreement and will be included in the printed list referred to in section 11, so long as he fulfils his obligations:

SEED CORN CONTROL AGREEMENT

On the part of growers who sell Seed Corn in the ear with The Minister of Agriculture of Canada.

With the object of controlling the trade in Ontario-grown seed corn to

protect purchasers and growers who aim to put only reliable seed on the market, the undersigned hereby agrees with the Minister of Agriculture of Canada (hereinafter called the Minister) to sell seed corn in the ear under the "control" system only, from date to May 31st, 1916, thereby making it subject to special regulations and guaranteeing the quality to purchasers under the following terms:—

1. The name of the variety and the grade of seed corn shall be given when advertising and giving quotations; shall be indicated on shipping invoices, and shall be exhibited on the crates or sacks containing seed corn, or on tags securely attached thereto.

2. Each crate or sack containing seed corn sold in the ear, or the tag attached thereto, shall, before leaving the possession of the grower, be marked with the name of the variety, and one of the three following grades: Extra No. 1; No. 1; No. 2.

3. The standards of quality for the grades shall be as follows:

- (a) Extra No. 1 seed corn shall consist of corn in the ear, containing at least 95 per cent of sound well-developed ears that are uniform and typical specimens of the variety named; it must be carefully selected and be cured in a special corn drying house, or by some other approved method equally efficient; and the germination on the basis of the average of ear test, must be not less than 95 per cent.

- (b) No. 1 seed corn shall consist of corn in the ear containing, at least, 90 per cent of sound ears that are reasonably uniform and typical specimens of the variety named; and the germination, on the basis of the average of ear test, must be not less than 90 per cent.

- (c) No. 2 seed corn shall consist of corn in the ear containing, at least, 85 per cent of sound ears of the variety named; and the germination, on the basis of the ear test, must be not less than 80 per cent.

4. The Minister through his seed laboratories and inspectors, will render all pos-

sible assistance in sampling and testing seed, but the grower shall be responsible for correct marking of grades on the crates or sacks containing the seed corn, or on the tags attached thereto.

5. All "controlled" seed corn will be subject to inspection and sampling by seed inspectors or purchasers. If the marking on a lot is questioned, a representative crate or sack will be taken as a sample. The samples shall be sent to the Chief Inspector of Seeds, Department of Agriculture, Ottawa, who, after making such investigation as he may deem necessary to determine whether the corn at the time of shipping was wrongly branded, will decide the grade on the basis of general appearance, quality, and the germination test.

6. A sample for official grading must be taken by an inspector or purchaser in the presence of a witness within seven days from the time the shipment is received by the purchaser, and when sent to the Chief Inspector of Seeds for grading shall be accompanied by a statement signed by the witness and the person taking the sample, giving the name and address of the grower, the name and the variety of the corn, the grade mark on the packages, or tags attached thereto, and the number of crates or sacks in the lot. A seed inspector may sample the shipment anywhere in transit as under the Seed Control Act.

7. A blank form to be used when sending samples to the Chief Inspector of Seeds for official grading, if the quality is suspected, together with a copy of the terms of this agreement, shall be sent by the grower to the purchaser with every shipment of seed. These forms will be supplied by the Minister.

8. In case the sample sent for official test is given the same grade by the Chief Inspector of Seeds as it was marked by the grower, the sender of the sample shall be notified. If, according to the grading of the Chief Inspector of Seeds, the corn is lower in quality than the standard of the grade marked, reports will be sent to both the sender of the sample and the grower,

and the grower will be notified to make settlement in accordance with the terms defined in the two following paragraphs:

9. In case the sample sent for examination by an inspector or purchaser is lower in grade than it was marked according to the decision of the Chief Inspector of Seeds, settlement shall be made on the following basis:—

(a) If the purchaser is willing to accept the seed under the grade given by the Chief Inspector of Seeds, an allowance in price will be made corresponding to the difference in the quotation of the two grades at the time of the sale; or,

(b) If the purchaser does not wish to accept the seed on the basis of the lower grade he may return the whole lot in question, the grower to pay transportation charges both ways, and promptly refund any money that may have been paid.

10. Settlement for samples sent for official test shall be made as follows:—

(a) If the sample sent for test conforms to the grade mark, the person from whom the sample was received will lose the sample and bear the cost of shipping it for test, or it will be returned at his expense; or,

(b) If the grade of a sample which is sent for test is lower than marked, the grower who sold the seed will lose the sample and bear the cost of shipping.

11. The Minister may publish an alphabetical list of the growers of seed corn who are selling controlled seed.

12. This agreement with the grower may be cancelled at any time if, in the opinion of the Minister, based on the report of the seed inspection staff, the grower is not fulfilling his obligation.

.....
Signature of Grower.

.....
Address of Grower.

.....
Date of Signing Agreement.

The labour problem on the farm, as a result of enlistment, will be both in the east and in the west an acute one. Financial difficulties, especially in the West, have not been wholly solved by the big crops of 1915. Hay and clover and other important crop seeds will be high. Fertilizers which are an absolute necessity in the east have advanced 20 per cent and more. But despite all of these difficulties the farmer, if he can feel reasonably certain of his market, will do his share. Nevertheless he needs the assistance of the financial men, the bankers of the country. He needs the aid of those who are in a position to direct the marketing of surplus products of the farm. And he will respond to the recognition which he deserves from leaders in every line of business in Canada, who must recognize that the only enduring basis of prosperity in this country is the production of real and permanent wealth.—*Prof M. Cumming, Truro, Nova Scotia.*

THE FRUIT BRANCH

NOTES REGARDING SEASON 1915-16

BY K. B. ROBINSON

AS was noted in the December, 1914, issue of THE AGRICULTURAL GAZETTE, under "Fruit Inspection in the Maritime Provinces", that year the inspectors in Nova Scotia, instead of being placed at the export points, as had been usual previously, were detailed for work almost entirely at the producing centres. This was in order to experiment with the scheme of inspection at point of shipment, which has been desired for many years by practically all of the large packers and shippers. Owing to the fact that the industry is fairly well concentrated in Nova Scotia, it was possible to secure very good results in this way with the staff at our disposal, and the system of inspection at point of shipment was continued in that province during the past year.

Last season the system was extended to Ontario, but it was a more difficult matter to arrange the work owing to the fact that fruit growing is carried on commercially in several widely separated districts of the province. It was necessary, therefore, to appoint some additional inspectors to cover the active packing and shipping season. These men, eight in number, were placed in the Niagara Peninsula, in Western Ontario, generally, and in the district north of Lake Ontario. Together with the usual staff of temporary inspectors in Ontario, numbering fourteen, it was possible to do the greater part of the inspection work in the orchards and packing houses. The inspectors were instructed to spend as much time as possible with the packers and shippers, giving them information as to the proper method of packing

and grading their fruit, it being felt that the *prevention* of violations of the Fruit Marks Act was of more importance and value, not only to the fruit owners and dealers, but to the consuming public, than the *detection* of such violations after the fruit had been shipped. In hundreds of cases, owing to the presence of the fruit inspectors, the grade on whole carloads was lowered to comply with the law, and in many instances the fruit was re-packed. In addition to the cases of re-packing and re-grading actually reported by our inspectors, there is no doubt but that their constant presence at orchards, packing houses and shipping stations had the effect of making shippers more careful to conform to the requirements of the law. This was particularly valuable last year, when the crop was light and everywhere of poor quality, due to the scab, which, owing to the unfavourable weather conditions during the growing season, developed to a greater extent than had been experienced for many years. Dealers found it most difficult to fill their contracts for No. 1's, making the temptation even greater than usual to include inferior apples in that grade; and the fact that the major part of the fruit offered for sale during the winter had been honestly graded may be fairly credited, to a large extent, to the activity of our fruit inspectors in the shipping districts.

INSPECTION OF EARLY FRUITS

While the inspection of apples has always formed the chief work of the inspectors under the Inspection and Sale Act, Part IX, it was possible

last season, with an increased staff, to respond to the requests that have been made to this Branch for a closer inspection of early fruits. Many complaints had reached this office with respect to the shipping of immature fruit, particularly strawberries, cherries, etc., and also with regard to the failure of many shippers to properly fill the boxes and baskets containing small and tender fruits. Early this season our inspectors were instructed to pay special attention to this end of the industry, and they were on duty (in the Niagara district and the western peninsula where tender fruit are grown commercially) early enough in the season to see a large proportion of the fruit as it was shipped. The mere fact that the packers and shippers knew the inspectors were on hand had the effect of preventing the shipping of much immature fruit and the under-filling of packages, which had been common in former years. As a result of our inspectors' reports, a great many packers were written to from this office with respect to their failure to honestly fill the berry boxes and fruit baskets. The shippers were also written to with regard to the shipping of immature fruit, and all cases of over-facing were followed by a close investigation, twenty of these investigations resulting in convictions for violation of section 321 (c) of the Inspection and Sale Act, Part IX (The Fruit Marks Act). These violations were with respect to currants, peaches, pears, tomatoes and apples, all, of course, in open packages. Owing to the larger staff at our disposal this

season in the producing district, we were able to inspect the small fruits in a way that was never possible heretofore, and it is expected that the work of the past season, together with the convictions secured in some cases and the instruction and warning given in many others, will result in a marked improvement in the packing of these fruits next season.

INSPECTION IN BRITISH COLUMBIA

In British Columbia two short term inspectors were appointed in addition to the usual staff. These men were on duty from the first of August until the end of October, and were detailed for work in the Okanagan district. Special attention was paid in this province also to the early fruit, and all cases of over-facing, shipping of immature fruit and improperly filled packages were investigated. In addition, these short term inspectors were able to give valuable assistance in the matter of instructing packers as to the requirements of the Act in connection with grading and packing. It might be noted, also, that owing to the splendid response the men of British Columbia have made to the "call to arms", the producing districts have been practically denuded of expert packers, and the industry was consequently seriously handicapped. Our inspectors, both expert packers, were able, therefore, to do particularly valuable work by assisting in the education of the girls and younger boys who had to take the place of the experienced packers of former years.

That the consolidated school movement is gaining impetus in Southern Alberta is evident from the fact that seven school districts in the neighbourhood of Barons have voted for consolidation, and will have a central school located at Barons to serve these districts. It is planned to teach agricultural work to a certain extent. The benefits to the community from such an educational institution should soon make themselves apparent. It will bring to the children of the rural districts some of the benefits of a high school education which they would otherwise be unable to obtain.—*Country Life in Canada*.

THE HEALTH OF ANIMALS BRANCH

MEAT AND CANNED FOODS DIVISION

THE SEX OF CATTLE SLAUGHTERED

COMMENCING with the beginning of the present year, the Meat Inspection Division of the Health of Animals' Branch, has collected from establishments operating under its super-

vision, statistics showing the sex of the cattle slaughtered, from month to month. The following statement is for the month of January, which month is a slack period:

CATTLE SLAUGHTERED AT INSPECTED ESTABLISHMENTS DURING JANUARY, 1916

SEX REPORT

	Slaughtered, Number	Bulls, Percent	Steers, Percent	Cows, Percent	Heifers, Percent
All Canada	28,281	6 78	43 20	34 90	15.12
Ontario	15,217	5 76	37 45	33 30	23.49
Quebec	7,006	12 29	31 75	48 07	7.89
Manitoba	1,814	5.07	56 23	34 13	4.57
Saskatchewan	87	2 30	85 06	12.64	
Alberta	2,656	2 48	79 10	17 32	1.10
British Columbia	1,450	.96	75.31	21.38	2.35
Prince Edward Island	51	13.72	15 69	68 63	1.96

In addition to the 28,281 cattle slaughtered in these establishments there were killed a large number of

calves. The sex report shows that 64.19 per cent of these were male, and 35.81 per cent female.

THE ANIMAL CONTAGIOUS DISEASES ACT AMENDED

The Order under "The Animal Contagious Diseases Act" of date the 8th day of January, 1916, as amended by Order of date the 17th day of January, 1916, is hereby further amended by adding thereto the following:—

"Transit through Canada of cattle, sheep, goats and swine from the Union Stock Yards, Chicago, to United States points is permitted under the following conditions:—

(a) Shipments must be accompanied by a certificate of health signed by an officer of the Bureau of Animal Industry.

(b) Cars must be clean and provided with 10-inch foot-boards to prevent escape of manure in transit.

(c) Cars must be under seal while in transit through Canada.

(d) Cattle, sheep, goats and swine must not be unloaded in Canada unless special permission is granted by the Veterinary Director General for use of stockyards reserved for this traffic only."

Dated at Ottawa, this sixteenth day of February, 1916.

(Sgd.) GEO. F. O'HALLORAN,
Deputy Minister of Agriculture.

PART II

Provincial Departments of Agriculture

THE VALUE OF FARM PRODUCTION IN 1915

THE January number of THE AGRICULTURAL GAZETTE contained a statement from the Department of Agriculture in every province except Quebec with respect to the crop of 1915. The February number contains a corresponding statement from Quebec. In order to learn the value of that magnificent yield the same officials were asked for their respective estimates of the valuation, not only of the field crops but of the returns from the orchard, the garden, the dairy, poultry and other branches of agriculture. The following replies have been received:

PRINCE EDWARD ISLAND

BY THEODORE ROSS, B.A., SECRETARY FOR AGRICULTURE

WE have no means of arriving at the end of November gives an estimate of the yield and value of the field crops to be \$11,130,000 made up as follows:

CROP	Yield	Value
Wheat.....	600,000 bush.	720,000
Oats.....	6,500,000 "	3,120,000
Barley.....	130,000 "	100,000
Peas and Beans	12,000 "	30,000
Buckwheat	80,000 "	60,000
Mixed grains	480,000 "	275,000
Potatoes.....	3,750,000 "	2,125,000
Roots.....	4,000,000 "	700,000
Hay.....	300,000 tons	4,000,000
Total value of produce to farmer		\$11,130,000

NOVA SCOTIA

BY M. CUMMING, B.A., B.S.A., SECRETARY FOR AGRICULTURE

THE 1915 crop report is based upon the return of 315 correspondents, the largest number that has ever reported in the history of the Department of Agriculture. Although the yields of certain crops, like apples and potatoes, have been low, yet the extraordinary hay crop and the excellent condition of the pastures with the consequent good results from live stock have, so far as the whole province is concerned, atoned for these deficits. The yield and value of each of the staple crops are detailed in the following table:

CROP	Yield	Value
Oats.....	4,318,050 bush.	\$2,372,177
Wheat.....	385,000 "	481,250
Barley.....	167,384 "	117,168
Buckwheat..	266,225 "	199,659
Peas.....	3,621 "	8,147
Beans.....	18,311 "	54,933
Rye.....	21,128 "	16,902
Mixed grains..	142,176 "	99,523
Potatoes....	4,289,220 "	3,645,921
Turnips....	6,560,180 "	820,022
Mangels....	590,320 "	73,709
Hay.....	959,893 tons	13,438,502
Forage Crops, i.e., green feed for cattle.		79,788
Apples.....	601,250 barrels	1,503,125
Garden truck and small fruit....		1,250,000
Total value of field products.		\$24,347,658

In addition to the foregoing there should be included at least 50 per cent of the returns from such live stock products as milk, butter, wool, lambs, etc., a large proportion of which is produced on pastures of which no reckoning has been made in the foregoing table. Moreover, there should be included an estimate of the profit made from feeding purchased and home-grown feeds to live stock. The additional income estimated on these scores (50 per cent of the total returns) is \$8,000,000. This brings the total returns from

the agricultural industry in the province of Nova Scotia for the year 1915 up to \$32,347,658.

The outstanding increase of the year has been from the dairy cow. This is, perhaps, best indicated by the returns from the creameries, the output of which has been 34 per cent in advance of last year and over 400 per cent in advance of 1910. The other noticeable feature was the record crop of hay, the king crop of Nova Scotia, the yield being 30 per cent ahead of 1914.

NEW BRUNSWICK

BY J. B. DAGGETT, SECRETARY FOR AGRICULTURE

UNFORTUNATELY we are not in a position to give very much information as to the production of last year, except in field crops and dairy products. We have no statistics as to the amount of live stock and poultry products produced each year. The following is the estimated value of the yields for 1915:

FIELD CROPS	
Oats.....	\$2,700,000
Buckwheat..	542,750
Wheat.....	337,500
Potatoes....	8,384,951
Turnips....	487,648
Total.....	\$12,452,849
DAIRY PRODUCTS	
Butter....	\$335,450
Cheese....	173,250
Total.....	\$508,700

QUEBEC

BY H. NAGANT, EDITOR, JOURNAL D'AGRICULTURE

THE outstanding feature of the season of 1915 was a long period of fine, sunny days, and a correspondingly long drought during the summer, with only a small number of local showers, very limited in extent. It was only during the last few weeks that fairly heavy rains fell, supplying much needed moisture for the growth of crops.

Our main crop, Timothy hay, does not exceed 67 per cent of the average, but the quality is very good. Clover has suffered more or less from the spring frosts and the summer drought. However, farmers were advised to save a good quantity of seed for this year's seeding. The pastures, which are the basis of our dairying industry, were poor during the summer (only 63 per cent), and improved only with the fall rains. This was made up to some extent by the high price of dairy products.

The yield of potatoes was also below the average. The tubers were rather small, but of excellent quality.

Fortunately, if some crops yielded poorly, others, such as cereals, field roots and peas, were much above the average. Wheat, which comes again to the fore on a good many farms, gave a good yield (86 per cent).

The farmers, in a number of districts would do well to treat their seed grain for smut next spring, as this disease caused some damage, especially in oat fields.

In districts where the climate is particularly suitable for the growing of corn, as in the Eastern Townships, this crop gave splendid results. Many more farmers were encouraged thereby to build silos.

Among field roots, swedes and mangels gave the best yields.

Tobacco and tomatoes were slightly damaged by early frosts.

The grasshoppers, which during the last few years have invaded the central part of the province of Quebec, have caused serious damage and discouraged a number of farmers. Their ravages were checked, in a number of localities, by the use of poisoned bran spread on the soil.

An increase of at least 20 per cent in the area seeded in grain is reported. The land for wheat was prepared better than usual.

YIELDS OF POTATOES, FIELD ROOTS AND FODDER PLANTS

(Census and Statistics Monthly, Ottawa, January, 1916)

	Total Yield Bushels	Total Value
Spring wheat...	1,411,000	\$1,891,000
Oats.....	42,182,000	23,200,000
Barley.....	2,255,000	1,939,000
Rye.....	145,000	162,000
Peas.....	404,000	998,000
Beans.....	103,000	327,000
Buckwheat...	2,568,000	2,157,000
Mixed grains...	2,997,000	2,188,000
Flax.....	7,000	15,000
Corn for husking...	508,000	569,000
Potatoes.....	17,510,000	9,631,000
Turnips, mangolds, etc.....	3,144,000	1,132,000
Hay and clover...	3,682,000	58,507,000
Fodder corn.....	293,000	1,872,000
Alfalfa.....	8,100	95,000
Total..		\$104,688,000

MANITOBA

BY A. J. MCMILLAN, B.S.A., DEPUTY MINISTER OF AGRICULTURE

The following statement shows the yield of each of the field crops, the average price received, and total value in each case, together with the amounts and values of live stock and dairy products, for the year 1915.

96,662,912 bush.	Wheat.....	@	94 1/2	\$91,346,451 84
101,077,991 "	Oats.....	@	.38	38,409,636 58
35,423,495 "	Barley.....	@	56	19,837,157 20
739,808 "	Flax.....	@	1 77	1,309,460 16
364,572 "	Rye.....	@	1.00	364,572 00
64,955 "	Peas.....	@	1.20	77,946 00
7,736,368 "	Potatoes.....	@	.72	5,570,184 96
3,116,181 "	Roots.....	@	.45	1,402,281 45
203,369 ton	Hay.....		9.12	1,859,285 28
52,713 "	Fodder corn.....		7.50	395,347 50
	Dairy products.....			3,845,183 82
329,994	Horses.....	\$150.00 each		49,499,100 00
631,005	Cattle.....	6 56 per cwt.		41,393,928 00
76,577	Sheep.....	7.53 "		576,624 81
286,433	Pigs.....	8.00 "		4,468,354 80
154,969	Turkeys.....	.18 per lb.		251,049 78
83,961	Geese.....	.16 "		94,036 32
881,335	Chickens.....	.15 "		528,801 00
104,665 lb.	Honey.....	.10		10,466 50
Total.....				\$261,239,868.00

NOTE:—Cattle are averaged at 1,000 pounds per head
 Sheep " " 100 " "
 Pigs " " 195 " "
 Turkeys " " 9 " "
 Geese " " 7 " "
 Chickens " " 4 " "

SASKATCHEWAN

The following table gives the estimated yield and value of field crops and other products of Saskatchewan in 1915, also numbers and value of live stock owned in Saskatchewan, 1915:

	Acreage	Yield	Yield per acre	Price	Value to Producer
Wheat.....	6,884,874	173,723,775	25 2	.83 1/2	\$145,059,352
Oats.....	2,846,949	130,910,048	45 9	.30	39,273,014
Barley...	272,299	9,043,813	33 2	.44 1/2	4,024,496
Flax.....	539,674	6,060,499	11.2	1.50	9,090,748
Hay.....		1,127,598 tons		6.25	7,047,487
Potatoes.....		4,311,440 bush.		.50	2,155,720
Roots.....		2,052,160 "		.50	1,026,080
Butter and Milk					1,429,596
Wool clip.....		900,000 lb.		.20	180,000
Fish.....					
Game and Furs.....					1,500,000
Horticultural and Garden.....					1,109,906
Poultry and Products.....	Number			Value	Total Value
Horses.....	667,443			150.00	5,670,102
Cows.....	358,540			80.00	100,116,450
Cattle.....	573,021			40.00	28,683,200
Sheep.....	192,024			7.50	22,920,840
Swine.....	329,246			9.00	1,300,180
					2,968,214

Total value of produce to farmer..... \$373,550,385

ALBERTA

ESTIMATED YIELD AND VALUE OF AGRICULTURAL PRODUCTS, 1915

	Acreage	Bushels	Yield per Acre	Price	Revenue
Wheat, S.	1,200,000	42,000,000	35.00	\$ 85	35,700,000
Wheat, W.	45,000	1,575,000	35.00	.85	1,338,750
Oats.	1,450,000	65,250,000	45.00	.35	22,837,500
Barley.	420,000	14,700,000	35.00	.50	7,350,000
Flax.	50,000	600,000	12.00	1.35	810,000
Rye.	17,500	612,000	35.00	.70	428,750
Speltz.	2,000	64,500	32.00	.70	45,150
Hay.	100,000	Tons 200,000	tons 2	10 00	2,000,000
Potatoes.	45,000	900,000	200.00	.35	3,600,000
Turnips.	16,000	3,200,000	200.00	.20	640,000
Carrots.	5,500	1,100,000	200.00	.30	330,000
Animals slaughtered and sold					20,500,000
Butter, eggs and milk.					11,000,000
Wool clip, (1,750,000 lb. at 27c.)					472,500
Horticultural products					150,000
Poultry and products.					3,000,000
Total value					\$110,202,650

LIVE STOCK	Number	Price	Value
Horses.	620,000	\$100.00	\$62,000,000
Swine.	400,000	10.00	4,000,000
Sheep.	525,000	5.00	2,625,000
Dairy cows.	210,000	50.00	10,500,000
Other cows	175,000	40.00	7,000,000
Beef cattle	200,000	50.00	10,000,000
Other cattle.	540,000	25.00	14,000,000
1915.			\$110,125,000

"Our fundamental need in English education is for leadership by a great statesman, strong through support from a great weight of public opinion and resolved to kindle in England a purposeful zeal for educational reform. Granted this, the national will would effectively focus itself on this question and produce such a change in our customary standpoint as to get far more than hitherto out of the devoted labours of our teachers and educational administrators. A world-famous thinker once said: "Whatever we wish to see introduced into the life of a nation must first be introduced through its schools and universities." This is true, but the nation must be determined to get it thus introduced and must itself co-operate in diffusing its influence through all the channels of home life and of industrial activity. And in order to further the British idea of civilization, British schools must essay a double task, endeavouring to impart both the love of knowledge and the care for conduct; love of adventure and readiness to endure routine; capacity for individual initiative and patience in the work of scientific co-operation."—*Prof. Michael E. Sadler, Leeds University.*

THE SELECTION AND EQUIPMENT OF DISTRICT REPRESENTATIVES' OFFICES

THE articles that ensue, bearing on the status of District Representatives and the provisions made for carrying on the duties of the office, were sent to THE AGRICULTURAL GAZETTE in response to the following letter of inquiry, addressed to officials of the provincial Departments of Agriculture:

"Most of the provinces have now District Representatives established at various points. While the work is more or less similar in each of the provinces there is considerable variety in the character and equipment in the offices used. That the best ideas on this subject may be made available to contemporary workers, would you kindly describe the usual building and its equipment adopted for this purpose in your province, and also your ideal of such an office that local circumstances may have in some cases enabled you to have secured."

PRINCE EDWARD ISLAND

BY THEODORE ROSS, B.A., SECRETARY FOR AGRICULTURE

IN Prince county the market building in Summerside was purchased for government offices. Mr. Reid, the District Representative for the county, describes the building as follows:

The Agricultural Hall at Summerside is about 155 feet long and 40 feet wide, divided into three main rooms. The office is situated in the centre of the building and is about 13 by 40 feet. On each side of it is a large room, one 40 by 70 feet is used for seed fairs and large

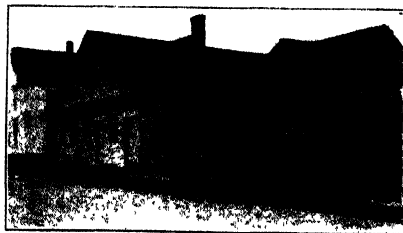
general gatherings, while the other is intended for a domestic science kitchen. It is 40 by 45 feet. The second floor of the hall is used for large general meetings and gives excellent accommodation for a large audience.

Mr. Tennant, District Representative for King's County, had temporary quarters in the Agricultural Hall at Charlottetown, and when that building was taken over by the militia, he was given office room in the Prince of Wales College.

NOVA SCOTIA

BY REV. HUGH MCPHERSON, DISTRICT REPRESENTATIVE

THE Agricultural Building in the town of Antigonish was built jointly by the municipality of Antigonish, the Antigonish Board of Trade and the government of Nova Scotia. It is well lighted and heated and though not a costly building is quite a useful one. It forms the agricultural headquarters for the farmers of Antigonish county. In winter it provides room for the

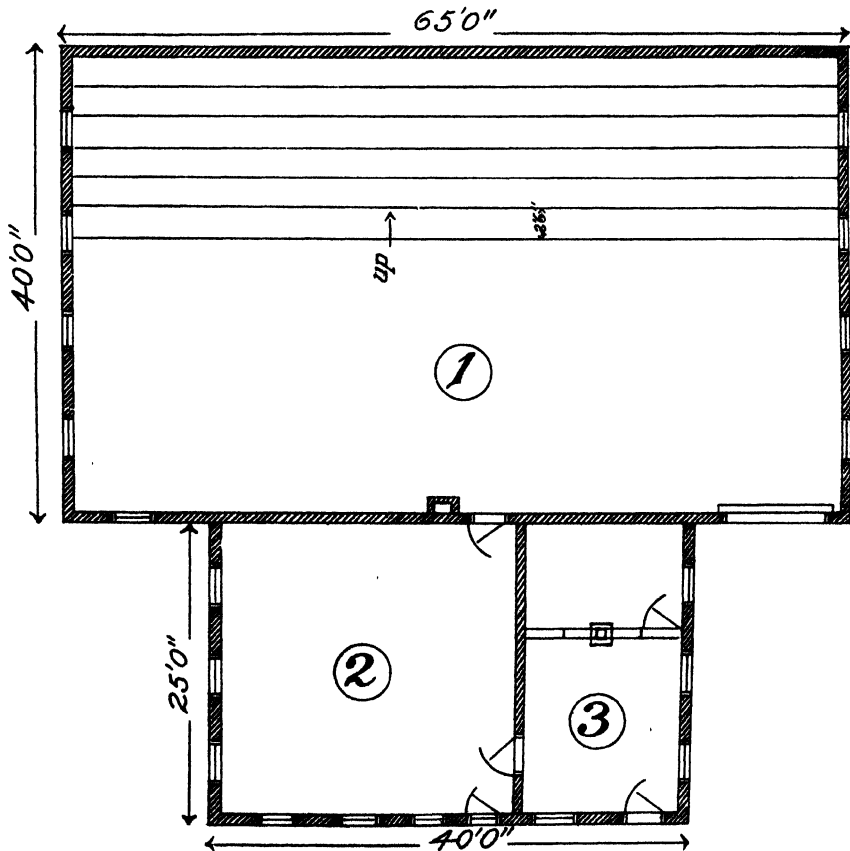


DISTRICT REPRESENTATIVE HEAD-
QUARTERS, ANTIGONISH, N.S.

short courses in agriculture. During those held in 1915 the spacious pavilion seated as many as three hundred persons, with ample room for live stock classes. During May and June of last year the pavilion was transformed into a warehouse for wool where 12,000 lb. were graded, while the offices and lecture room were used by the clerk for weighing and ticketing. In fact when not being used for live stock demonstrations the large pavilion can be used as a

farmers' warehouse for temporarily storing feed, fertilizers or other bulky goods. During December of last year the building accommodated a very successful poultry show held by the local poultry club.

The offices are occupied by the District Representative for the county and the lecture room is very convenient for the farmers of the vicinity for holding their agricultural society and other meetings.



GROUND FLOOR PLAN, AGRICULTURAL BUILDING, ANTIGONISH, NOVA SCOTIA

(1) Pavilion; (2) Lecture Room; (3) Offices

THE LAWRENCETOWN DEMONSTRATION BUILDING

A "Demonstration Building", which had been erected at a cost of three thousand dollars, was formally opened at Lawrencetown, N. S., on Tuesday evening, February 8th, Principal Cumming presiding. The building, which was constructed partly from the grant derived under THE AGRICULTURAL INSTRUCTION ACT, partly from a County Council grant and partly from private subscription, is situated on a four-acre lot designed to give the boys of the community a public playground. The building it is proposed to use as agricultural headquarters for the county. As soon as a County Representative is appointed he will have his office there.

The structure is constructed of wood, shingled all over and having a cement hollow block foundation and cement brick chimneys. One of the features is a conveniently sit-

uated lecture hall capable of comfortably seating 75 people. A large space in the rear will be arranged in amphitheatre style for demonstration work. It is also so situated as to be available for use at county exhibitions. An extensive room over the lecture hall will be used as a museum and repository.

The sketch on the following page shows the disposition of space and front view of the building, which is located near the main highway on an improved field and orchard lot with southern exposure, sloping gradually to Annapolis river at the rear. The building and its surroundings, with the uses to which they are to be put, form a practical application of "the community centre" idea.

It should be mentioned that, following the formal opening, a short course was held extending to the end of the week.

QUEBEC

BY H. NAGANT, EDITOR, JOURNAL D'AGRICULTURE

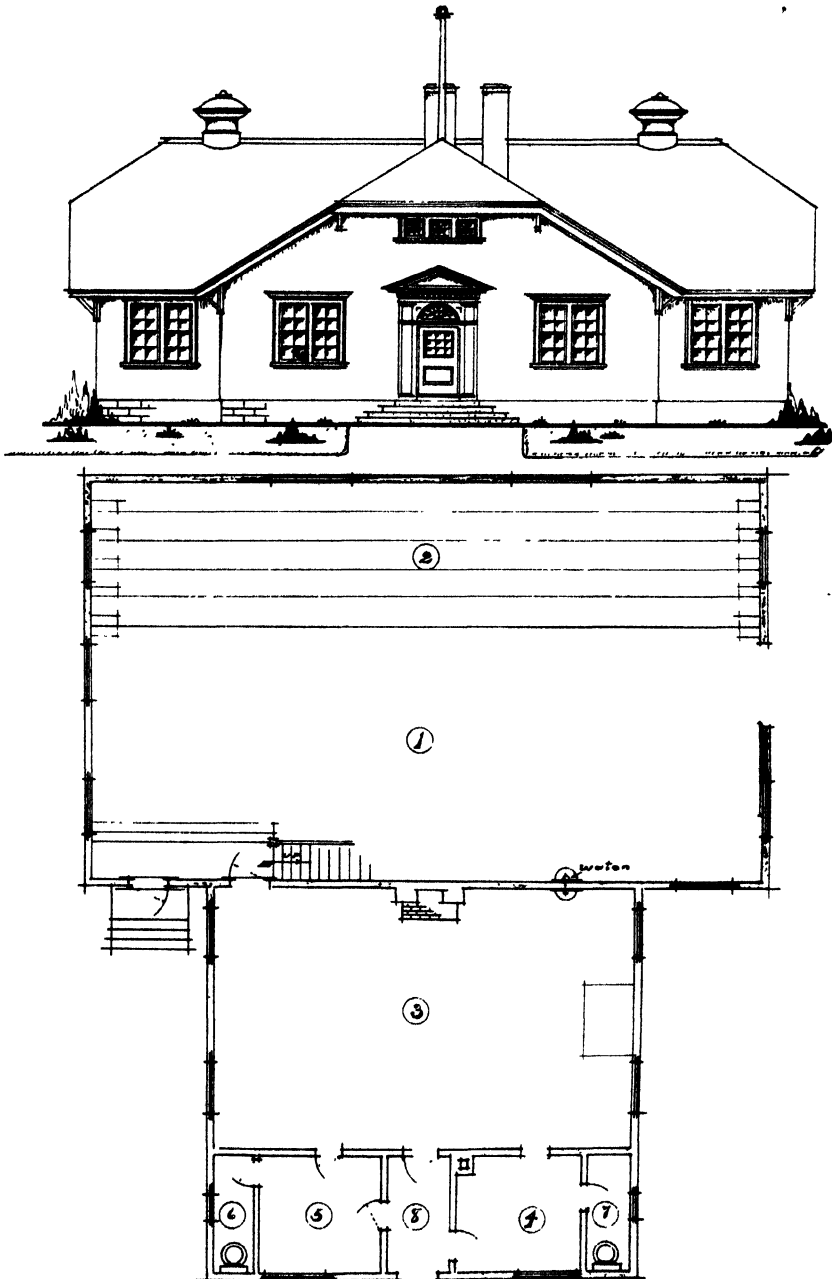
THE District Representatives of the province of Quebec have not required so far very elaborate offices or equipment, but they have nevertheless done good work and fulfilled all the duties which had been entrusted to them; such as the supervision of the work of agricultural societies, agricultural clubs and co-operative associations of their districts; the promotion of the development of agriculture in all its branches; visiting the farmers in order to give them verbal or written instructions; encouraging the teaching of agriculture in the schools and the organizing of school fairs and school competitions, etc.

Some of the agriculturists own the house in which they live, and they utilize the lot which is attached to

the house to conduct experiments in cultivation or for giving practical demonstrations.

Office of Mr. J. C. Magnan, St. Casimir, Portneuf County.—Mr. Magnan's office, which measures 18 x 15 feet, includes the desk of the representative, the desk of the assistant and three book-cases. Another room contains a work-table, a book case for bulletins and magazines, a set of horticultural tools, and collections of grain samples. Mr. Magnan, who owns a small farm at St. Casimir, has built there an elegant pavilion which is used when needed as a demonstration hall for the pupils of the college, which is close by.

Office of Mr. R. A. Rousseau, B.S.A., Acton Vale, Bagot County.—



GENERAL VIEW AND FLOOR PLAN OF THE AGRICULTURAL DEMONSTRATION BUILDING, LAWRENCETOWN, NOVA SCOTIA

- (1) Demonstrating theatre with earth floor; (2) Raised portion with removable terraces for seating;
 (3) Lecture room; (4) Office; (5) Library; (6) and (7) Toilets

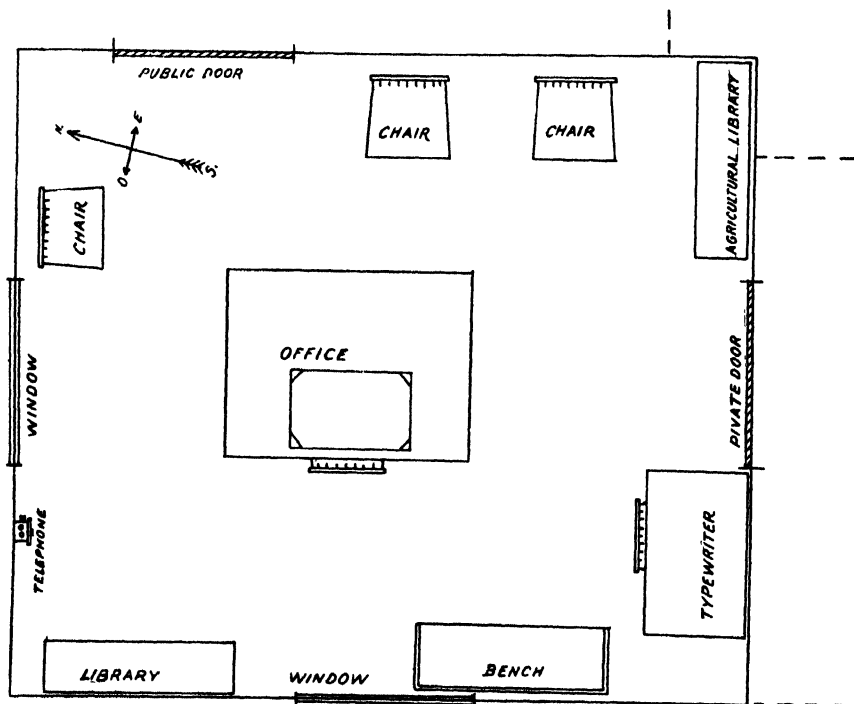
In the splendid farm cottage which is owned by Mr. Rousseau two rooms are reserved for the service of agriculture: one, the office, includes the desk of the representative, tables and chairs for visitors, book cases, etc., in the other, the agricultural papers, magazines, pamphlets and circulars are classified for distribution.

Office of Mr. J. M. Leclair, B.S.A.,

though of modest appearance, is well patronized by the farmers and settlers who are in need of information.

Well equipped and well-appointed offices are also provided for Mr. A. Raymond, B.S.A., District Representative for Bellechasse County, stationed at St. Valier, and Mr. A. Desilets, B.S.A., L'Ange Gardien, Montmorency County.

Conclusion.—The system of dis-



OFFICE OF A. DESILETS, B.S.A.

Agronomist of the L'Ange-Gardien District, Montmorency County, Quebec

Harricanaw, Abitibi.—In this new district traversed by the Transcontinental and recently opened to civilization, there are very interesting agricultural problems to solve and a number of studies to make. The demonstration plots established by Mr. Leclair for the first time in this district in 1915 have yielded excellent crops of cereals and vegetables. The office of the agriculturist, al-

though of modest appearance, is well organized recently and it has not been possible, as yet, to furnish them with all the collections and series of articles which will constitute, in the future, a small agricultural museum. Meanwhile, great improvement is to be observed among the numerous farmers who follow the examples and the advice of their representatives.

PONTIAC COUNTY

BY J. K. KING, B.S.A., MACDONALD COLLEGE DEMONSTRATOR

THE Demonstration office for Pontiac county is located on the main street of Shawville in one of the most central business parts. In this way farmers coming to the town on business do not have to go out of their way to call on the demonstrator.

A plate glass window five by seven feet is used to advertise seasonable operations on the farms, that the Demonstration Branch wishes to draw to the special attention of the farmers. In the month of March, samples of the standard varieties of grains giving the best results in the county are shown; in April, the different grades of wool produced in the county are exhibited with properly rolled fleeces.

In this way the window indicates what the Demonstration Branch is featuring for each month of the year. The general office is given over to the stenographer, the files of the office correspondence, index files, agricultural papers, bulletins, exhibits of grain, grasses, plant diseases, etc. Another room somewhat larger than the general office is used as the Demonstrator's private office, where the Demonstrator keeps a reference library and such material that is in constant use. In this way he is not being constantly disturbed by telephone calls, the noise of the typewriter and callers, who can be dealt with by the stenographer.

EQUIPMENT

For the office equipment it was found necessary:

1st. To have letter files, that all correspondence be kept for at least one year. In connection with the letter files a card index was found to be of help for rapid work.

2nd. A card index of all farmers in the county was found to be of great assistance to the work; each card bearing the farmer's name, address, and his special line of work, if any, quality of crops, stock (kind and number), buildings, soil and any particular that might be of value to the demonstrator. In connection with the card index a small coloured metal tag was attached to the card and found to be of great help in locating farmers following any particular line of work, breed of stock, etc.

For demonstrating at lectures, exhibitions, and in the office, it has been our object to use the actual material, and where not possible, models have been made use of. Lantern slides have been found useful in illustration lectures and in this connection a reasonable size camera comes into good use, so that one may make slides of local interest.

From one year's experience a car has been found to be cheaper transportation than livery and, when the saving in time is considered, it is one of the most necessary articles of equipment for the Demonstrator.

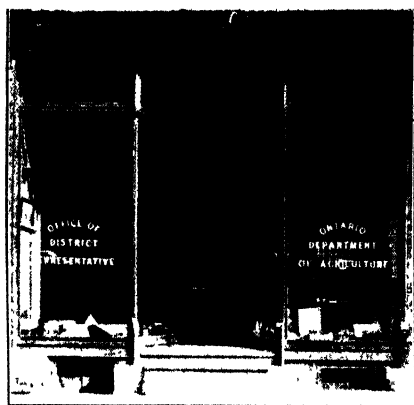
ONTARIO

BY C. F. BAILEY, B.S.A., ASST. DEPUTY MINISTER OF AGRICULTURE

IN selecting a District Representative's office, it has usually been the practice to choose one centrally located, near an hotel frequented by farmers, and in the larger towns it is particularly desirable to have it

on or near the market square. With few exceptions ground floor offices have been secured, as they are much easier of access, and enable the District Representative to make timely window displays which are always of

educational value and attract the attention of the passer-by. For this purpose large show windows are desirable. In the main, buildings built primarily for stores are being used, and for convenience are usually divided into three compartments. The front room is used as the District Representative's private office. Adjoining it is a larger office used as a meeting and reading room—here all the latest farm papers and bulletins are kept on file, as well as a display



OFFICE OF A. P. MACVANNELL, B.S.A.
District Representative for Prince Edward county
Picton, Ontario

of demonstration materials of various kinds. The third room is arranged at the back as a workroom, and is also used for storing various materials. The basement of the building is very useful in storing heavy equipment, such as tents, seat trestles, etc. In some places, the second storey of the building is secured and used to advantage for class room purposes, farmers' club meetings, Women's Institute meetings, etc.

ADAPTATION OF A PRIVATE RESIDENCE

In the town of Whitby, where the office for Ontario County is situated, we have an innovation. Here what was formerly a private residence has been transformed into a very

desirable office. Although it is not on a business street, it is centrally located and is being well patronized by the farmers of the district. On the ground floor of this building are four rooms. The front room on the west side is used as the office of the District Representative and his assistant. Adjoining this is the stenographer's office. On the east side is one large double room which is used as a class room and reading room, while at the rear is a workroom containing a sink and cupboards. Shelves have been arranged in the classroom on which are kept supplies of bulletins, samples of feeds and fertilizers, specimens of plant diseases and insect injuries, etc. On the second floor is "The Women's Rest Room," which is under the supervision of the Women's Institute. There are also several other rooms on this floor, which are utilized for storing papers, magazines, grains, grasses and various kinds of equipment. Adjoining the house is a long building, 21 by 60 feet. In it are kept the cars belonging to the District Representative and School Inspector, a tent, spray outfits and other bulky apparatus. At one end of the shed, a portion has been partitioned off for horse stable and poultry house. It is intended to use part of the shed for conducting crate-fattening experiments and such work. Included with the buildings is about $\frac{3}{5}$ of an acre of land, the greater portion of which is lawn in front of the buildings and is planted with large pine, maple and chestnut trees. At the back of the buildings is a small plot of ground, some 50 feet wide by 90 feet long. This is to be used for conducting experiments with different kinds of crops. The rent for this property is somewhat less than that charged for buildings with 25 feet frontage on the main business street, and the additional accommodation afforded makes it a very advisable arrangement wherever possible.

EQUIPMENT OF THE AVERAGE OFFICE

While the equipment of the District Representatives' offices is much the same all over the Province, it naturally varies to suit agricultural conditions. The following list of equipment will serve to give some idea of what is to be found in the average office:—

District Representative's desk.

Assistant's desk.

Filing cabinet—6 drawers for correspondence and general records; 5 drawers for card index; 6 deep drawers; 6 shallow tray drawers.

Office filing boxes—for bulletins and reports.

Five office chairs.

One director's table.

Three dozen chairs for meetings.

Typewriter desk and chair.

Bookcase.

Bookcase shelves for filing office filing boxes.

Typewriter.

Roneo duplicator.

Library books—standard agricultural topics.

Microscope and magnifying glasses.

Drainage instruments—Ducopy level, staff, steel tape, chain, home-made drainage level.

Milk testing apparatus—Babcock tester for testing milk and cream.

Pruning tools.

Spraying apparatus—pumps, tanks and general equipment.

Poultry house models.

Mustard spraying attachment.

Dairy milk cooler.

Trusses and supports for seats at short courses.

Tables for rural school fair work.

Tent—30 by 50 feet.

Box press for apple packing.

Glass tubes and physical apparatus—soil work.

Entomological apparatus—Ricker mounts, insect boxes, breeding cases, net, mounting board, etc.

Scales.

Milk testing apparatus—Cow-testing association work; scales, box, bottles, dipper, tablets, etc.

Lantern for showing lantern slides.

Lantern slides.

Pictures and photographs.

Map.

Bird chart.

Reports and bulletins.

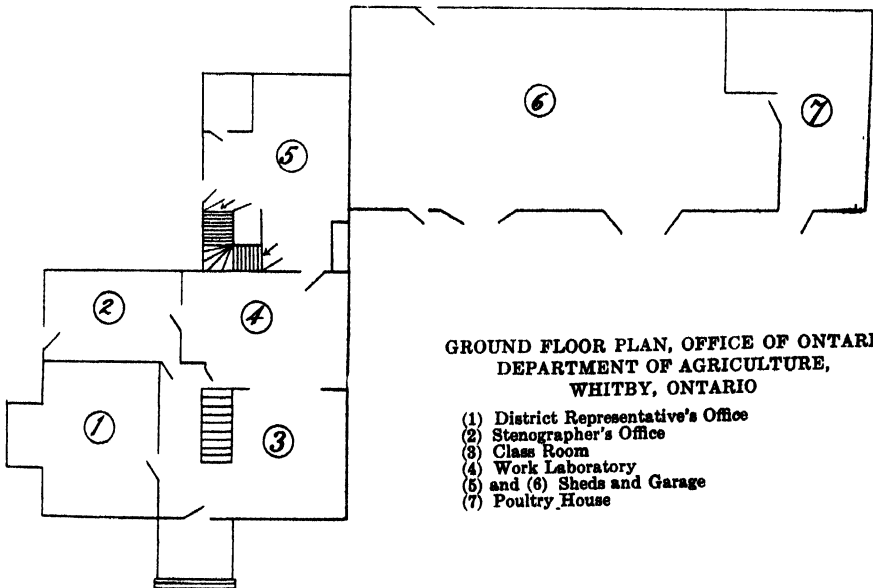
Ford motor.

Grain sieves.

Camera.

Negative and photo albums.

General office equipment—Letter paper, trays, ink, pencils, pens, scales, etc., etc.



GROUND FLOOR PLAN, OFFICE OF ONTARIO
DEPARTMENT OF AGRICULTURE,
WHITBY, ONTARIO

- (1) District Representative's Office
- (2) Stenographer's Office
- (3) Class Room
- (4) Work Laboratory
- (5) and (6) Sheds and Garage
- (7) Poultry House

SASKATCHEWAN

BY F. H. AULD, ACTING DEPUTY MINISTER OF AGRICULTURE

IN 1915, the first year in which District Representatives were engaged by this Department, four men were appointed with district headquarters at North Battleford, Rosetown, Swift Current and Shaunavon. As yet no permanent office quarters have been provided, but when possible, suitable temporary quarters were secured. Each representative was given a flat-topped oak desk and vertical filing cabinets, and other necessary office equipment, together with a number of standard works on agriculture and agricultural papers and magazines.

The District Representatives in this province have much larger territories than is the case in some of the other provinces, consequently each man was provided with a Ford runabout, and during the summer months from four to six days each week are spent on the road.

This form of service, so far as Saskatchewan is concerned, is in the initiation stage, and once it becomes more firmly established, the question of permanent office-quarters and equipment will receive more attention.

AGRICULTURAL CREDITS

It may seem premature at this stage of the conflict to touch upon the question of policy to be pursued after its termination. But this I feel justified in stating, that the Government is fully alive to the importance of taking immediate action looking to the promotion of desirable immigration and land settlement, both during and after the war, and the creation of all necessary machinery and organization to that end. The future of Canada rests with the development of its great resources, of which the greatest and most fundamental is agriculture, and this development is in turn bound up with the question of increase in population of the productive soil and the facilities afforded it for the application of its intelligence and industry. It is probable that in the straitened financial conditions which may prevail for some years forward the question of capital for the development of agriculture may be of paramount importance, and it is our intention to inquire carefully during the coming recess into this most important subject, with a view, if desirable in the public interest, to supplement by federal aid existing facilities in this connection. Particularly will the question of establishment of a system whereby loans at reasonable rates repayable on the amortization principle engage the attention of the Government.—*Sir Thomas White* in his Budget speech February 15th, 1916.

FARM LABOUR

ONE of the greatest problems facing Canadian agriculturists is that of an adequate supply of Farm Labour. Realizing that good work has been accomplished by the various provinces in supplying help where needed, a letter was addressed to the Deputy Minister of Agriculture in each province requesting a statement outlining the policy adopted and the success achieved. Following are the replies received:

NEW BRUNSWICK

BY J. B. DAGGETT, SECRETARY FOR AGRICULTURE

THE demand for labour upon the farms in New Brunswick during the summer months for a number of years has exceeded the supply. The lumber operations of the province demand a large number of young men during the summer upon the streams, in rafting and otherwise handling logs. This makes a scarcity of help for the farmer. To meet the situation, it has been the policy of the Government, through their Agent General in London, to bring out every spring, in the latter part of March or early in April, as many farm labourers as possible. The Immigration Division, which is under the direction of this Department, with an office in St. John, takes charge of the settlers when they arrive at St. John. The Superintendent of Immigration previously has advertised for those desiring help and when the parties arrive they are immediately placed. Agents are employed during this period in Woodstock and Moncton. The labourers

are sent forward to them and they are distributed to the farmers who have made application. This policy has worked out very satisfactorily.

During the summer months the immigrant would get acquainted with the country and the great majority have remained permanently in the province, many of them now being on farms of their own, in many cases taking advantage of the Farm Settlement Act, by which they are enabled to obtain farms on easy terms.

Last spring, because of war conditions, we made little effort to obtain help from the old country and but very few came out of their own desire. This year we have decided to make no effort and will not encourage young men to leave the old country. With the hundreds of young men who are enlisting from the province for military service it now looks as though there would be a great scarcity of help next spring.

QUEBEC

BY S. DUFALT, DEPUTY MINISTER OF MINES AND COLONIZATION

WE are supplying through our immigration agencies a good deal of labour particularly in the Eastern Townships and in the neighbourhood of the cities of Montreal and Quebec. The number of farm hands so placed during the last three years is as follows:

July 1912 to July 1913	281
" 1913 " 1914	277
" 1914 " 1915	38

As the majority of the men placed with farmers as labourers are immigrants, the European war explains the low figures of the last year.

We shall certainly continue to distribute farm labourers to those farmers who need help and make application for assistance.

ONTARIO

BY W. BERT ROADHOUSE, DEPUTY MINISTER OF AGRICULTURE

AS the Colonization and Immigration Branch has been attached to this Department for a number of years past, the Department of Agriculture has had the handling and placing of farm labour. As part of the organization to this end an office is maintained at 163 Strand, London, England, from which is directed the propaganda in the British Isles for the securing of an adequate supply of farm labour and domestic servants. This is, of course, supplementary to the work which is done through Federal agencies for the Dominion as a whole.

Since the outbreak of war immigration has ceased, in fact the Department has made no effort to encourage any able-bodied man to leave the British Isles and come out to this province, as it was felt that there was more immediate service nearer home which he could render to his country, either in uniform or in munition production.

Consequently it was necessary during the past season to look elsewhere for farm labour. The only place within the province to look was to the towns and cities. It was felt that there must be a considerable number of men available in towns and cities who had had some experience in farm work, and who

would show considerable aptitude along these lines. Accordingly two or three men experienced in selecting and placing men on the farm were sent around to different cities and towns in the province last spring. They utilized the columns of the local papers to advertise for help, and took the names of farmers who were anxious to secure help. In this way they came in contact with both the demand and the supply, and were able to satisfy both. The plan worked very well indeed, and hundreds of men were placed in this way, and have rendered satisfactory service. At the same time the cities were relieved of some of the unemployed. In addition, a general appeal was made through the press and otherwise to farmers to employ as many men as possible in order to keep them occupied. Through these means, as well as through the fact that the local supply of labour in every small town and village available for farm purposes was greater than usual, it is safe to say that the farm labour demand was filled to a larger extent in the province of Ontario in the past season than for many years past.

Conditions, of course, have now changed with the greater demand in industrial work, and the greater number of enlistments.

SASKATCHEWAN

BY THOMAS M. MOLLOY, SECRETARY, BUREAU OF LABOUR

THE Department of Agriculture through its Bureau of Labour conducts a free public employment agency which makes a specialty of supplying competent farm help to the farmers of the province. The work of supplying the demand for farm help during the spring, summer and winter seasons

is, as the result of a number of years' experience, pretty much a matter of routine and is handled much along the same lines as the work of an ordinary free employment office. The securing and distribution of the large army of men required for the harvest fields is, perhaps, the most important fea-

ture of the work of the free employment offices of the Bureau. The number of men required, the points at which men are needed, and the source of supply vary each year according to the size of the crop, and the economic conditions prevailing in the centres from which men are generally obtained.

THE METHOD ADOPTED

By special reports secured from Boards of Trade, Grain Growers' associations, regular and special correspondents, together with the records of past years, the Bureau estimated that 20,000 additional labourers would be required for the harvest of 1915. It was thought that 5,000 of these men could be secured in the province, and that about 15,000 would have to be imported. Upon receiving reports and estimates of the men required in each district, these estimates were then checked and verified with the reports of the Department respecting probable yield and condition of crops in the various sections of the province. In each section or district an effort was made to secure the services of some responsible party to act as distributing agent for all men sent to that particular district or locality. For this work the services of the Secretary of the Board of Trade, or of the Grain Growers' association,

or the Secretary-Treasurer of the rural municipality, was almost invariably volunteered. These local agents accepted applications for men direct from the farmers of their respective districts, and informed the Bureau at Regina at short intervals as to the number of men needed, and the probable date they would be required. For the distribution of these men central offices were temporarily opened in the principal cities of the province as well as at Winnipeg, the distributing point for the eastern harvesters. From these offices men are directed to the different distributing agents throughout the province according to the needs of each section, and each man sent out is given a card of introduction to the local distributing agent, who in turn directs the men to those farmers from whom he has received application for men.

Believing that the supply of men from Eastern Canada this year would be inadequate, the department secured from the railways a low rate for labourers from British Columbia as well as a special rate from the cities of Saskatchewan. During the harvest season the Bureau distributed 26,750 men; 15,200 were obtained from Eastern Canada, 2,600 from British Columbia, 7,250 from the cities of the province, and 1,700 were soldiers from the military camp at Sewell.

ALBERTA

BY CHARLES S. HOTCHKISS, CHIEF PUBLICITY COMMISSIONER

FOR a number of years past it has been the custom to hold a conference in Winnipeg during the month of July between the three railways and the government officials of the three Prairie Provinces to make arrangements for the supply of farm labour for the harvest season.

Western railroads are very much alive to the question of harvest help,

in nothing are they more ready to co-operate and actively assist than in securing sufficient labour to handle our harvests. Extremely low rates are given to induce eastern men to do this work, which also affords a splendid opportunity for the farmers of the East to personally visit our province and see for themselves its agricultural resources.

With the exception of 1914 and

1915, Alberta received from five to fifteen thousand men annually from outside sources. In 1914 no outside help was required on account of using the farmers from the district where the drouth shortened, and in a considerable area wholly destroyed, the crop. During the year just passed arrangements were made with the military authorities to use the soldiers in training at Sarcee camp. The Department also brought in a little over one hundred hand-picked men from Vancouver, late in the season, to fill the places of soldiers who returned early for camp duties.

CO-OPERATION OF THE RAILWAYS

In addition to moving harvest help into our province at greatly reduced rates, arrangements were made with three of our principal railway lines to grant a rate of one cent per mile going from the cities of Calgary and Edmonton for *bona fide* harvesters to the nearest harvest field within the province.

In order to avoid confusion, and to protect the railway companies, certificates signed by a government official were necessary for all labourers in order to obtain this reduced rate and to acquire correct information as to just where help was required. In former years when our help was brought in from the East, distribution was made at Winnipeg upon information of a more or less uncertain nature, which led to confusion and dissatisfaction in a great many cases, but we were able in the past year to distribute our help without confusion or disappointments.

Our experience in arranging for and supplying harvest help suggests that great care and attention should be exercised in obtaining information in regard to the number of men required, as well as to the careful distribution of labourers.

Our present plan is to secure a responsible farmer in every township, a U.F.A. official if possible, to canvas his neighbourhood and report

fully, giving date and number of men required; by this method we secure someone who is reliable and generally a person who will interest himself in a practical way in getting men well located without delay.

HOW THE SUPPLY IS MADE

We formerly experienced considerable confusion when labourers were directed to report to merchants and others in towns. We now aim to send every man direct to a farmer where help is required. After securing all the data possible in regard to the probable number of men required, we carefully considered industrial conditions in our towns and cities and the probable number of homesteaders who might be available, and added to these the number of soldiers offering their services, and, although we had by far the largest harvest in both acreage and yield we ever had, with few exceptions we were able to satisfy all demands for help from the sources above mentioned without bringing assistance from outside the province.

From year to year we find an ever-increasing number of homesteaders from the newly settled districts available for harvest help, and as the harvest is from ten days to two weeks earlier in the Peace River district than elsewhere, and railway transportation is now available, we are likely to receive more assistance from the North in future than heretofore.

Big yields and high wages invariably go hand in hand. Our prevailing wages were from \$2.50 to \$3.50 per day with board. One of the striking phases, however, of our harvest help question this year was that the demand for help brought out some twelve hundred homesteaders, four thousand soldiers and about six thousand labourers from our towns and cities, many of whom were employed from sixty to ninety days at labour in many cases more or less hazardous, and up to the present time we have yet to hear of the slightest accident or injury to a single labourer.

WEED CONTROL

THE pestilence that a plague is to the human race, noxious weeds are to agriculture. In their suppression, therefore, the entire community is interested. This unfortunately is a point all too frequently overlooked. In some instances suppression has been made a matter for direct provincial action. In others, it has been formally left to the municipalities, and in one or two cases no legislative action has seemingly been taken.

In the June, 1914, number of THE AGRICULTURAL GAZETTE, a symposium was given of the course pursued in the different provinces. The following articles are supplementary to the series then published and indicate the progress that has been made, and the additional action taken, in Ontario, Saskatchewan, Alberta and British Columbia:

ONTARIO

BY J. E. HOWITT, M.S.A., PROFESSOR OF BOTANY, O. A. C., GUELPH

AS far as I am aware no further measures have been taken to enforce the present Ontario Weed Act, and in most counties it is still a dead letter. This Act is administered by the various county councils.

The Ontario Agricultural and Experimental Union in 1914 appointed a committee to make a study of the Weed Acts of Canada, with the object of gathering information which could be applied to the improvement of the present Ontario Act. A circular containing the following questions was accordingly sent to farmers in the 600 townships of Ontario:

QUESTIONS RE ONTARIO ACT TO PREVENT THE SPREAD OF NOXIOUS WEEDS

1. Is any attempt being made in your township to enforce the Provincial Act to prevent the spread of noxious weeds?

2. Has your Township Council ever appointed an inspector to enforce this Act in respect to noxious weeds ripening seeds on occupied and

unoccupied land, or on the property of railway companies?

3. If such inspector has been appointed, has he been able to successfully enforce the Act?

4. Have the overseers of highways (path masters) or road commissioners, in your locality enforced successfully the provisions of this Act in regard to cutting or destroying the noxious weeds growing on highways of road allowances within their respective divisions?

5. Are you in favour of the strict enforcing of this Act as it now reads, and do you think that the provisions made for its enforcement are adequate?

6. Have you any suggestions to offer as to how this Act might be improved?

One hundred and sixty-eight reports were received out of the 600 townships in Ontario. In 92 townships of the 600 attempts were being made to enforce the Act. In 49 inspectors have been appointed. In regard to the work of inspectors, 17 townships reported the work of the inspectors satisfactory, 14 re-

ported that the work was partially satisfactory. Out of the 600 townships of the Province, 15 reported that the Act was successfully enforced, 72 that it was partially enforced, and 73 that it was practically a dead letter.

The following notice was added to the questions: "If this form is not returned it will be taken for granted that your Township Council has done nothing to carry out the provision of the Ontario Act to prevent the spread of noxious weeds." It has been taken for granted that in only 15 townships of the 600 of the province of Ontario has the Act been successfully enforced.

The results of the investigations of this committee and the recommendations made therefrom are contained in the following suggestions as to how the Act might be made more effective in Ontario:

1. By an organized effort upon the part of the Ontario Department of Agriculture, through the agency of Farmers' Clubs, Farmers' Institutes and the District Representatives of the Department of Agriculture, to make the farmers of Ontario acquainted with the provisions and regulations of the Ontario Act to Prevent the Spread of Noxious Weeds;

2. By amending the present Act so as to make it compulsory for every township council to appoint an inspector whose duty it shall be to see that the provisions of the Act relating to the destruction of weeds are carried out;

3. By the Ontario Government appointing county or district inspectors, who shall supervise the work of the township inspectors, and report to the Government any neglect of duty upon the part of the said inspectors;

4. By extending the present Act so as to prevent the following weeds maturing and ripening their seeds:

1. Wild Oats (*Avena fatua*).
2. Curled Dock (*Rumex crispus*).
3. Clustered Dock (*Rumex conglomeratus*).
4. Purple Cockle (*Agrostemma githago*).
5. False Flax (*Camelina sativa*).
6. Wild Mustard (*Brassica arvensis*).
7. Wild Carrot (*Daucus carota*).
8. Field Bindweed (*Convolvulus arvensis*).
9. Ribgrass (*Plantago lanceolata*).
10. Common Ragweed (*Ambrosia artemisiifolia*).
11. Ox-eye Daisy (*Chrysanthemum leucanthemum*).
12. Canada Thistle (*Cirsium arvense*).
13. Chicory (*Cichorium intybus*).
14. Perennial or Field Sow Thistle (*Sonchus arvensis*).
15. Burdock (*Articum minus*).
16. Wild Barley or Squirrel-tail (*Hordeum jubatum*).

Other weeds added to this list by the township council with or by the consent of the Minister of Agriculture.

SASKATCHEWAN

BY THOMAS DOMAILLE, ACTING WEED AND SEED COMMISSIONER

THE Weeds and Seed Branch, Department of Agriculture, Regina, during the year 1915 has followed along the lines employed in 1914, so far as municipal weed control is concerned. However; two new lines of control have been inaugurated, first, a survey of all railroad lines to locate and determine the extent to which Perennial Sow thistle has spread in the province, and, secondly, bringing pressure to bear on several towns and the city of Regina to take precautions against, and destroy all weeds within their respective corporations.

The reason for making a survey of the railroad lines was because of the fact that many of our noxious weeds have been introduced into the province by construction camps, settlers' effects and packing material used in shipping crates and boxes, etc. Perennial Sow thistle has become a menace to many parts of Manitoba, for which reason the Department of Agriculture in Saskatchewan, co-operating with the different lines of railway, made a thorough survey. In almost every case this weed was found on the sidings, only a few patches being located on the right-of-way. The

percentage of sidings infested is as follows: C. P. R. 44.7; G. T. P. 53.4 per cent; and the C. N. R. 44 per cent, making an average of 47.3 per cent of all the sidings.

Instructions were given to roadmasters and the section foreman of each section re the eradication of this weed wherever it was found.

It was ascertained that certain towns were neglecting altogether the eradication of noxious weeds within their boundaries, that no weed inspector had been appointed, and that no preventative measures were

being taken to stop the spread into the surrounding country of seed from these weeds. This branch through its field representative, Mr. E. H. Hawthorne, B.S.A., and through Mr. J. L. Brown, B.S.A., District Representative for the Department of Agriculture, caused several towns and the city of Regina to observe the rules of 'The Noxious Weeds' Act, the result being most satisfactory. This has been a step in advance to what has previously been undertaken and the results have justly upheld the methods employed.

ALBERTA

BY JAS. D. SMITH, SUPERINTENDENT SEED AND WEED BRANCH

OWING to the final reports of the local weed inspectors for 1915 not being complete, it is impossible to give accurately the total amount of work done by this branch. It is, however, gratifying to report that substantial progress has been made in controlling the growth of noxious weeds.

During the year fifty-six weed inspectors were engaged by the Department, and about the same number were engaged by the rural municipalities organized in the province. The inspectors engaged by the latter are under the supervision of the municipal officers. The chief inspector for the province undertakes to see that the work of the municipalities is in conformity with that carried on by the Department, and that the provisions of the Noxious Weed Act are put in force.

The provincial local weed inspectors are appointed during the months of April, May, June and July, according to the requirements of the various localities; the early appointments being made in the southern portion of the province, especially in districts infested with perennial and winter annual plants. Each inspector is required to look after

from nine to twenty townships; the area being determined by the acreage under cultivation, and the prevalence of weeds.

The duties of inspectors are defined by the Department, and are forwarded in printed form with their official appointments. Each inspector is requested to first acquaint himself with his entire district, but to devote the greater part of his time to the more thickly settled portions. He is supplied by the Department with official notices in triplicate, and is instructed to leave the original copy with the farmer whose land is infested, retain a copy for future reference, and forward the third copy to the Department for filing purposes. He is also requested to forward to the Department a report of each week's work, and at the end of the month a full report, with diary, expense account, etc. Weed bulletins issued by the Department are supplied to each inspector for distribution. Inspectors are asked in every instance to discuss the best methods of eradication, and they are instructed to use reasonable persuasion to get the weeds destroyed, but if an offender persists in evading the requirements of the Act prosecution must be resorted to.

In the year 1911 some forty-five inspectors were engaged, but they had to do the work of the entire province, as no rural municipalities were in operation. Covering a large field they were unable to follow out their instructions as systematically as might have been desired, with the result that only eighteen prosecutions were recorded.

INCREASE OF INSPECTORS

In 1912 the number of inspectors was increased by five, which decreased the size of their districts to some extent, with the result that better attention was given, and twenty-four prosecutions were recorded.

In 1913 the number of inspectors was further increased to sixty-three, and in the same year a number of rural municipalities was organized. According to their Organization Act they take the responsibility of controlling the weeds within their boundaries, and in most cases they engaged from one to three inspectors, thus the number of weed inspectors appointed in the whole province was almost double that of any previous year, with the result that the provincial districts were reduced to half the original size. The outcome of this was that the inspectors were enabled to do their work more carefully and more systematically; consequently over sixty prosecutions were recorded.

In 1914 the same regulation was put into force; some districts still being reduced through the further organizing of rural municipalities, but owing to the crop failure in that part of the province where weeds were most prevalent, it was found impossible to enforce the provisions of the Weed Act, as farmers had neither money to engage labour, or feed for their horses. This being the case very few prosecutions were undertaken.

Last year the inspection work was carried on to the same extent as in 1913, but we find that as the people become more familiar with the administration of the Weed Act, there is less need for prosecution, so that

the total prosecutions for 1915 did not exceed forty.

More attention was given to the inspection of threshing machines last season, when about six hundred machines were inspected, and from the reports received it is obvious that the machine owners are endeavouring to co-operate with the Department in their effort to control the distribution of weed seeds.

THE MOST SERIOUS PROBLEM

The problem that the Governments of the three Prairie Provinces have to face is not so much the weeds on the land which is occupied, as the weeds on the many thousands of unoccupied homesteads and farms held for speculation. In most cases this land is left uncultivated, and allowed to grow all kinds of noxious weeds. When the weed inspector searches the title at the Land Titles Office, it is invariably found that the owner lives in some other country where no procedure can be taken to make him destroy his weeds. The Department has cut and burned the weeds on many of these farms during the last few years, but, of course, it is impossible to take care of them all. Rural municipalities have had difficulty in financing this kind of work. The Wild Land Tax which came into force last year has had a good effect in this regard, as many holders of land are now either returning to their farms or disposing of them to some one who intends to operate.

The educational work of this important branch has not been neglected. Since 1912 nearly 25,000 weed bulletins have been distributed. The identification and eradication of weeds are being taught in all the public schools, and also through the higher grades. Special attention is given to this work in our agricultural schools. Lectures are given on this subject at our short course schools, institute meetings and seed fairs.

A familiar remark in the West is that there will be no trouble with

weeds when the people become educated to the losses caused by them, and the means of eradication. It is hoped that this will prove true, but the writer is firmly convinced that while education will undoubtedly have a wonderful effect, there

will always be need of police work, and that of the very best kind. The weed inspector has few friends and gets little sympathy, but what would be the condition of the agricultural land in Western Canada today had it not been for his efforts?

BRITISH COLUMBIA

BY WM. E. SCOTT, DEPUTY MINISTER OF AGRICULTURE

THE efficient control of noxious weeds in this province is becoming a very live issue with the farmer. There is a good Provincial Act on the Statutes which provides an efficient means for compelling owners to take the necessary steps to effectively destroy weeds growing on their lands. It has been found, however, that it is a very difficult matter to strictly enforce the provisions of this Act, though good work has been done in many districts.

The size and physical characteristics of this province render it an extremely difficult matter to effectively cover all parts. During last year, eight Noxious Weed inspectors were appointed. In addition, all provincial constables were appointed agents for this Department towards the enforcement of the provisions of the Noxious Weeds' Act.

The inspectors were each assigned to certain districts, and their duties were to keep travelling throughout the districts, see that the constables were doing their duty, visit farmers on their places, show them the different methods by which different weeds should be controlled, and generally to conduct an educative campaign amongst farmers, indicating the great loss that they were sustaining through

allowing weeds to grow on their places without let or hindrance.

In addition, a schedule of instructions was circulated amongst farmers throughout the province by this Department, giving instructions as to the methods which should be adopted towards the eradication of the principal noxious weeds which are in evidence.

We have found that this circular of instruction has done a very great deal of good. It is concise, and to the point, and any farmer who studies it knows how to handle each weed to the best advantage.

I am glad to report that a greater interest is being manifested by the farmers in the matter of noxious weeds. They are showing themselves on all hands willing to work in conjunction with this Department towards their suppression. In addition, at our institute meetings, the question of noxious weeds is being taken up by men competent to speak on the subject, and good practical advice is being given the farmers.

The greatest trouble that we have experienced is in the case of absentee owners, or land which has been subdivided and is now lying vacant. However, our Act gives us full power to deal with these lands, and very good work was done during the past season in destroying weeds on such lands.

NOVA SCOTIA

THE SCIENCE BUILDING

BY M. CUMMING, B.A., B.S.A., SECRETARY FOR AGRICULTURE

THE Science Building at the College of Agriculture, Truro, N.S., was formally opened on Jan. 11th, by Dr. C. C. James, Agricultural Commissioner for the Dominion of Canada. When Dr. James began his speech there were 500 people in the auditorium of the Science Building, and before he had finished

The building, which measures 50 by 120 feet, is built of a high grade red rough texture brick, having a purple cast laid with a wide white slush joint giving a varied and most interesting effect. The entire building is trimmed with light grey Wallace free stone, and the front façade has a central motif entirely in stone with



THE NEW SCIENCE BUILDING, COLLEGE OF AGRICULTURE, TRURO, NOVA SCOTIA

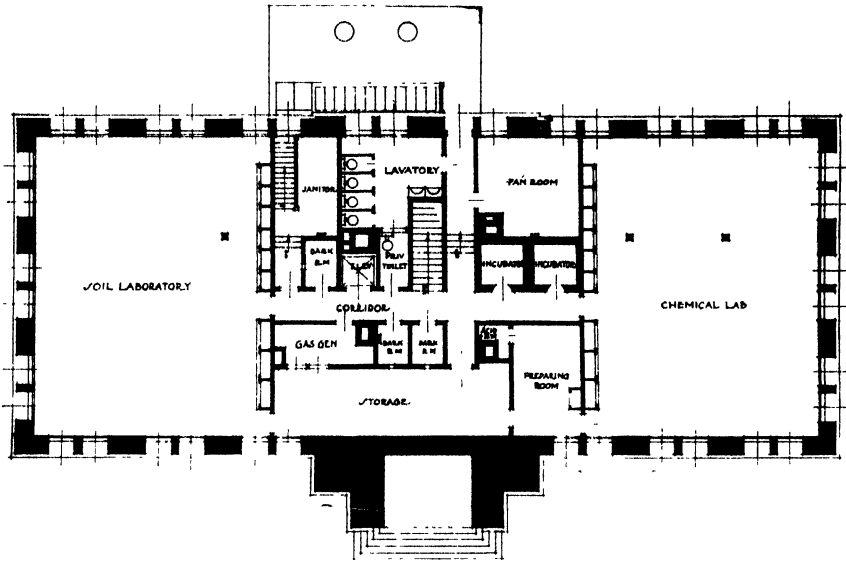
the number had nearly doubled so that it was necessary to adjourn to the main auditorium in the main college building. The occasion was during the short course and the convention of Women's Institutes in the province, hence the audience was a most representative one, each county in the province being represented.

two massive doric columns, pilasters and pediment, all making a most striking and effective elevation.

So far as disposition of space is concerned the most striking feature of the building is that the entire structure has been built high above the ground, giving the basement every appearance of an ordinary

floor from within, and the architect has succeeded in securing the desired result without sacrifice in the least of the exterior. Hence although the

ical laboratory in which 48 students can conveniently work at one time, but the desks of which contain cupboards for four times that number.

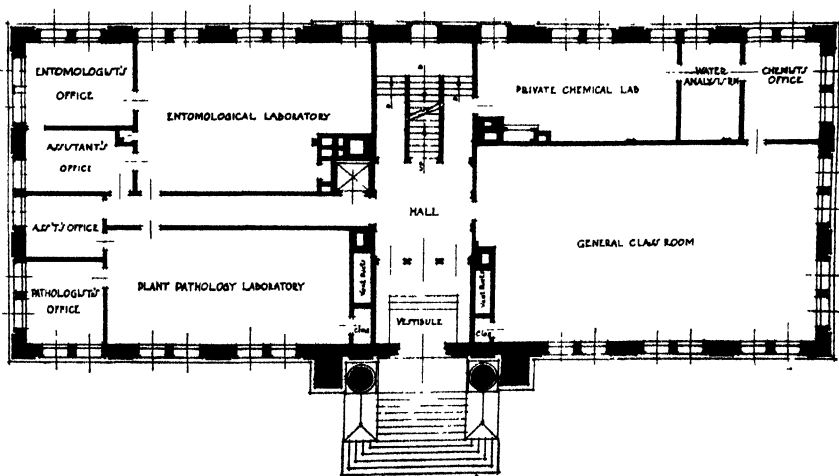


BASEMENT PLAN

building might be described as a two-storey building with a basement, it is actually a three-storey building.

In the basement is a general chem-

In the other end of the basement is a soil laboratory of the same dimensions. Between the two laboratories are to be found preparing and storage



FIRST FLOOR PLAN

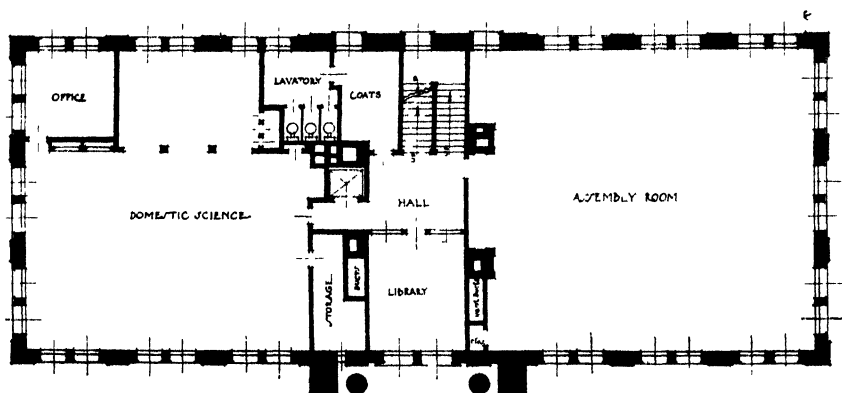
rooms, acid room, gas engine room, three dark rooms for photographic work, incubator rooms, and general toilets.

The ground floor provides a beautiful and most inviting front entrance with marble vestibule which leads into a spacious panelled foyer from which access is obtained to a large general class room, chemist's office, water analysis room, private chemical laboratory, entomological and

grain.

In addition to a most modern non-pressure vapour system of heating there has been installed a mechanical supply and exhaust system of ventilation, and a separate mechanical exhaust system has been provided for all the fume closets in the chemical laboratories.

This building, added to the previous equipment of the College of Agriculture at Truro, provides the



SECOND FLOOR PLAN

plant pathology laboratories, connected to both of which are two professors' offices. The second floor contains large domestic science room with office, pantry, food storage and laundry, all conveniently connected, a commodious library and reading room and a really beautiful assembly hall said to be one of the finest in the Maritime Provinces. The entire inside finish is of quartered oak selected for beauty and richness of

institution with facilities for giving just as thorough a course in agriculture as can be obtained at any other institution in Canada. But aside from its value from an instruction standpoint the well-equipped laboratories provide facilities for investigation work, which at the present time has not received the attention which the importance of the subject requires, and which the college plan it shall receive in future years.

THE GROWING OF TURNIP SEED

BY JOHN M. TRUEMAN, B.S.A., PROFESSOR OF AGRICULTURE, AGRICULTURAL COLLEGE, TRURO

IN 1915 one-half acre was devoted to turnips planted for seed. The turnips were selected in the field the previous fall from the variety known as "Sutton's Champion". Medium-sized roots of the typical shape for this variety were selected. These were kept in a cool cellar and

set out in a rich mellow piece of land on May 14th and 15th. They were set in rows 3 feet apart and placed 2 feet apart in the row. We decided later that it would have been better to have spaced the rows in a different manner on account of the difficulty of cultivating and harvesting. This

year we plan to place two rows 2 feet apart and then leave a 4-foot space and then two more rows 2 feet apart. The two rows will soon grow solid together, but we will be able to get through the wide spaces for cultivation and harvesting.

The land where the roots were grown received a dressing of 20 loads of manure per acre, and in addition 150 lb. of ammonia sulphate and 400 lb. Sydney basic slag. The seed stalks started strongly and some made a dense growth all over the field. Wherever the weeds made any headway after the plants were too large to cultivate the amount and

quality of the seed were reduced.

The stalks were harvested during the latter part of August and the first of September. Each stalk was shaken over a canvas to knock out all ripe seed. It was then placed on a rack to dry and later the seed beaten out on a canvas and collected. A good deal of seed was lost, the yield of clean seed only amounting to 250 lb. for the half acre.

In addition to the seed raised on the farm the horticultural department of the college grew about half an acre of seed from Corning variety. The seed from both lots will be sold by the farm department.

NEW BRUNSWICK

COMPETITIONS FOR BOYS AND GIRLS

THE Department of Agriculture announces a competition in swine raising for boys, and a Boys' and Girls' Poultry Club competition. The rules and regulations governing these competitions are as follows:

BOYS' COMPETITION IN SWINE RAISING

1. Open to boys of sixteen years and under, sons of farmers in each county in New Brunswick.
2. A boy on the farm may be the competitor, but only one in a family can enter the contest.
3. Each competitor must do all the practical work himself, but can receive advice and direction from parents or guardian.
4. Each boy entering the contest must attend, feed and care for the pig during the entire contest.
5. Contest to begin at any time in the month of May and close when pig is five months old.
6. The breeds to be used in the contest must be pure-bred Yorkshire, Berkshire, Chester White or Tamworth, or grades from any of the named pure-bred males. Pigs must be bred upon the farm or purchased.
7. The Department of Agriculture offers three prizes to be competed for in

each county and to be awarded for the largest, best fattened and best dressed pig, all the regulations specified to be complied with by the competitor.

8. Each competition to be under the supervision of an officer of the Department of Agriculture. He will have the right to visit the premises of competitor and to rule out any competitor from the competition at any time for any cause which he may deem sufficient.

Information as to the best method of feeding and caring for pigs will be supplied by the Live Stock Division, Department of Agriculture, Fredericton, N.B., the inspector to judge and award the prizes according to merit from each county.

9. At the close of the competition each competitor shall file with the inspector an estimate of cost of the production of the pig and shall also furnish the inspector with a declaration, signed by his parent or guardian, that all the conditions, rules and regulations of this competition have been faithfully complied with.

PRIZES

First prize.....	\$10.00
Second prize	7.00
Third prize.....	5.00

BOYS' AND GIRLS' POULTRY CLUB COMPETITION

1. Open to boys and girls of sixteen years and under, sons and daughters of farmers in each county in New Brunswick.

2. A boy or a girl on the farm may be the competitor, but only one in a family can enter the contest.

3. Each competitor must do all the practical work himself or herself, as the case may be, but can receive advice and direction from parents or guardian.

4. Each boy or girl entering the contest must set the eggs under hens or in incubator, attend and manage the incubation, care for feed and raise the chickens to roaster age in the fall. April and first week in May best time to hatch out the chicks.

5. The breeds to be used in the contest are pure-bred Barred Plymouth Rocks, Rhode Island Reds, Wyandottes and Orpingtons, or high grade crosses from pure-bred males of above breeds. Only one breed must be used by each contestant in order to have the lot all alike and uniform. Suitable eggs can be purchased for incubation if not produced on the farm.

6. The Department of Agriculture offers three prizes to the competitors in each county for the best dozen chickens raised by the farmer's boy or girl in each county according to conditions in Section 4.

7. Twelve or more chickens (cockerels preferred) of any of above breeds mentioned in Section 5 to be put into a fattening crate or pen the third week in October, 1916, and fed according to directions supplied to each contestant by the Provincial Poultry Superintendent.

8. Birds to be fed at least fourteen days and not longer than eighteen days, then

starved twelve hours and killed by bleeding in the mouth, plucked dry, undrawn, shaped and packed in a box of the proper size to contain twelve roaster chickens, and expressed to the Poultry Superintendent, New Brunswick Cold Storage, St. John, N.B., with name and address of shipper on the box, from the 7th to the 10th of November.

9. Information as to above method will be supplied by the Poultry Superintendent, who will be judge and will award the prizes according to merit of the exhibit from each county. In addition to the prize, the chickens will be sold at the highest market price and same remitted to the shipper.

10. Prizes will be awarded for the largest, the best fleshed, best quality, best conditioned, best dressed and best packed box of twelve chickens. The contestant is allowed to select for competition the best twelve birds from his or her own flock.

11. Each competitor's work during the competition will be subject to the supervision of a District Representative and the inspection of the Poultry Superintendent. At the close of the competition each exhibitor must furnish a declaration, signed by his or her parent or guardian, that all the conditions, rules and regulations of this contest have been faithfully complied with.

PRIZES

First prize.....	\$6.00
Second prize.....	4.00
Third prize.....	2.00

QUEBEC

QUEBEC FARMERS' AGRICULTURAL UNION

THE general meeting of the members of this association was held at Laval University on the 25th of January, 1916. Experimental work is not the only object treated at this institution; its programme also includes agricultural teaching and extension work.

ELECTION OF OFFICERS

The following officers were elected for 1916:

Honorary president, Prof. G. Reynaud; president, Prof. O. E. Dallaire, Director of the Provincial Dairy School, St. Hyacinthe, Que.;

vice-president, Mgr. G. A. Dauth, Vice-Rector of Laval University, Montreal; secretary, Br. M. Ligouri, La Trappe, Que.; treasurer, J. A. Tardiff; directors, R. F. Pacôme, Abbé of La Trappe, Oka; J. T. Bertrand, Isle Verte, Témiscouata county, Que.; R. A. Rousseau, B.S. A., Acton Vale, Que.

THE YEAR'S WORK AND THE PROGRAMME FOR THE COMING YEAR

The experimental work of the year includes the following:

1. The growing of test plots of alfalfa in all parts of the province,

including a total of about forty plots. Notwithstanding the frosts and thaws which greatly damaged all clover crops, the results obtained from this experiment were such as to encourage the Union to continue this work. Owing to the difficulty of obtaining other strains, a considerable quantity of the seed of Grimm's alfalfa will be purchased; this seed has given good results for the last two years, and is also more easily found in the trade than most varieties. Some other varieties will also be experimented with later on.

As much as possible, the District Representatives will be put in charge of this work.

2. The eradication of Couch grass. The best means of eradication are the summer fallow, clover and buckwheat crops ploughed in, and hoed crops.

Mr. L. A. Gareau, Dean of Agricultural Lecturers and Director of Agricultural Teaching in the province, submitted an interesting report on his experiments on the eradication of Couch grass. On well-drained land, the spring fallow, followed by a late crop, has given good results.

Mr. Gareau condemned the use of the disc harrow in fields infested with Couch grass; he commented on the dishonesty or the ignorance of certain agents of agricultural implements who recommend the disc harrow, even for such lands.

3. The most important part of the poultry work is the experiments on colony houses (small constructions of 5 by 10 feet), designed to accommo-

date eight setting hens; these colony houses would greatly simplify the feeding of brooding hens and of their chicks, and they would shelter the latter for some time. A bulletin containing the very satisfactory results given by this experiment will soon be issued. Cotton front poultry houses have also been built by the Union on the farms of some of its members, particularly in the Chicoutimi district. Pullets and hens, bred by the Union, have also been distributed. In order to obtain these the members have to fulfil certain conditions, the object of which is the propagation of pure breeds and of good and hardy strains.

4. Hens, ducks and bees have been kept and vegetables and fruits have been grown on the area which has been set apart as a demonstration field for teachers.

This tract of land, situated near the Quebec Normal School, is used for practical demonstrations for the students of the city. The teaching, which includes more subjects each year, was given by a gardener, a poultryman, an agriculturist, an agricultural college graduate who has been a District Representative.

5. Teaching is also partly the work of the Union, which publishes the results of its experiments at the various agricultural exhibitions of the province, where it is represented by its instructors. By means of publicity, of lectures and correspondence, the Union has greatly helped the development of agricultural co-operation among the farmers of the province.

THE SIXTH PROVINCIAL SEED GRAIN EXHIBITION

BY H. NAGANT, EDITOR JOURNAL D'AGRICULTURE

THE sixth provincial Seed Grain exhibition was held in Quebec on January 26 and 27, under the auspices of the Department of Agriculture for Quebec and with the co-operation of the Dominion

Department of Agriculture.

There were entries made by 225 farmers; these included 700 exhibits. Liberal cash prizes to the amount of \$911 were awarded to 90 competitors.

There were splendid exhibits from

the Central Experimental Farm, Ottawa, and the Experimental Station at Cap Rouge, as well as a first and very interesting exhibit of sheaves of grain from Abitibi, a new district opened to settlers.

The first day was spent in the examination and judging of seed grain under the direction of Messrs. Simard, Murray and Lavallée.

During the evening, in the presence of a large audience, lectures and speeches were given by the Hon. J. Ed. Caron, Minister of Agri-

culture for Quebec, on "the Progress of Agriculture in recent years"; Mr. Geo. Clark, Seed Commissioner of the Dominion Department of Agriculture; Mr. T. Charron, director of the provincial laboratory at St. Hyacinthe; Mr. J. H. Simard, Dominion Seed Expert, and Mr. H. M. Nagant, Professor of Chemistry at the Oka Agricultural Institute.

During the second day the seed grain judging contest took place. There were two contests, one for the young farmers and one for older men.

A POULTRY ASSOCIATION FOR THE PROVINCE OF QUEBEC

THERE are about ten local poultry breeders' associations in the province of Quebec, which hold only small local fairs, as their sources of revenue are rather limited.

On the 27th of January a meeting was held at the Sherbrooke Poultry exhibition, at which most of the local associations were represented by delegates, for the purpose of organizing a provincial association covering the whole province.

A provincial board was selected by the meeting to draft the constitution and statutes of the new association. A committee, composed of Messrs. Henry Miles of Montreal, Victor Fortier of the Central Experimental Farm, Ottawa, Professor M. A. Jull of Macdonald College, and Rev. Father Liguori of the Provincial Poultry Department, came to Quebec

on the 11th of February to meet the Hon. Mr. Caron, Minister of Agriculture, and ask him for assistance. The Minister was very favourable to the idea, and promised financial and other assistance, provided that the new association would work, first of all, for the benefit of the farmers, and not for the benefit of fancy breeders.

The annual membership fee is fixed at \$1. The headquarters of the association will probably be at the Department of Agriculture, Quebec.

One of the first things that will be attended to by the association is the organization of a great poultry exhibition in January or February, when the fairs arranged by the local associations are over. It is believed that this new institution will greatly stimulate the progress of aviculture in the province.

SHORT COURSES IN AGRICULTURE

FROM the 10th to the 15th of January, 1916, short courses in agriculture were held at St. Jean Port Joli, county of L'Islet; Matane, county of Matane; and in the districts of Bromptonville and Weedon in the province of Quebec. All of these courses were well attended. Instruction was given in rotation of crops, the use of manures and

chemical fertilizers, breeding of hogs for bacon, maple syrup and sugar making, bee-keeping, poultry keeping and domestic science. The instructors included Messrs. Bois, Letourneau, Bouchard, Savoie, Pasquet Dionne of the School of Agriculture, Ste. Anne de la Pocatière, and Miss Leblanc and Miss Anchil of the St. Pascal Domestic Science School.

THE MAPLE SUGAR INDUSTRY

REALIZING the necessity of encouraging the maple sugar and syrup industry the provincial Minister of Agriculture has had established four sugar-making schools, in which the best methods of manufacturing maple sugar and syrup and the marketing of these products will be taught. These four

schools are situated at Beauceville, county of Beauce, with accommodation for six pupils; at Ste-Louise, county of L'Islet, with accommodation for ten; at La Minerve, county of Labelle, with accommodation for twelve, and at St. Casimir, county of Portneuf, with accommodation for eight.

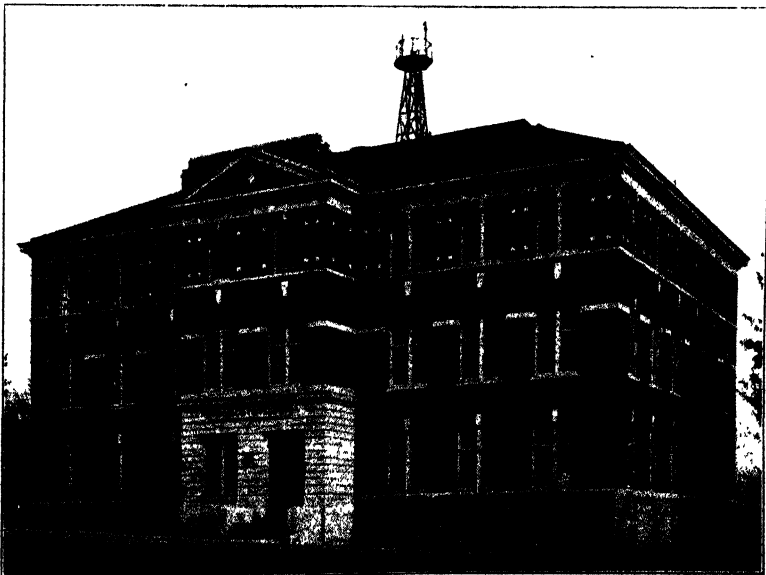
ONTARIO

NEW PHYSICS BUILDING, O. A. C., GUELPH

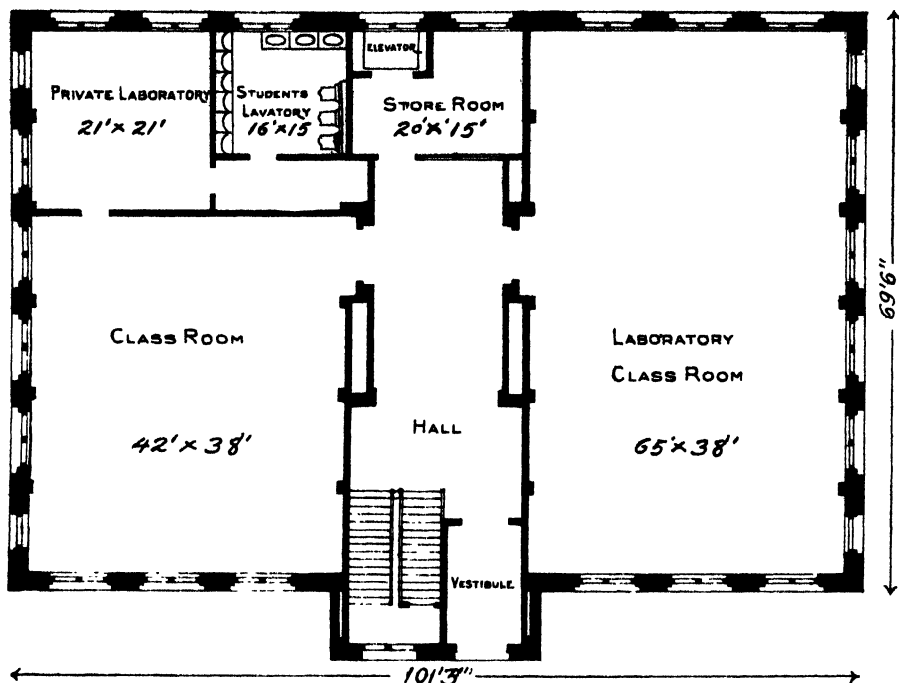
BY W. BERT ROADHOUSE, DEPUTY MINISTER OF AGRICULTURE

DURING the past year there has been added to the buildings of the Ontario Agricultural College an imposing structure for teaching and investigation work in Soil Physics. It is a four-storey, steel-framed building, having a frontage of 101 feet 9 inches, with a

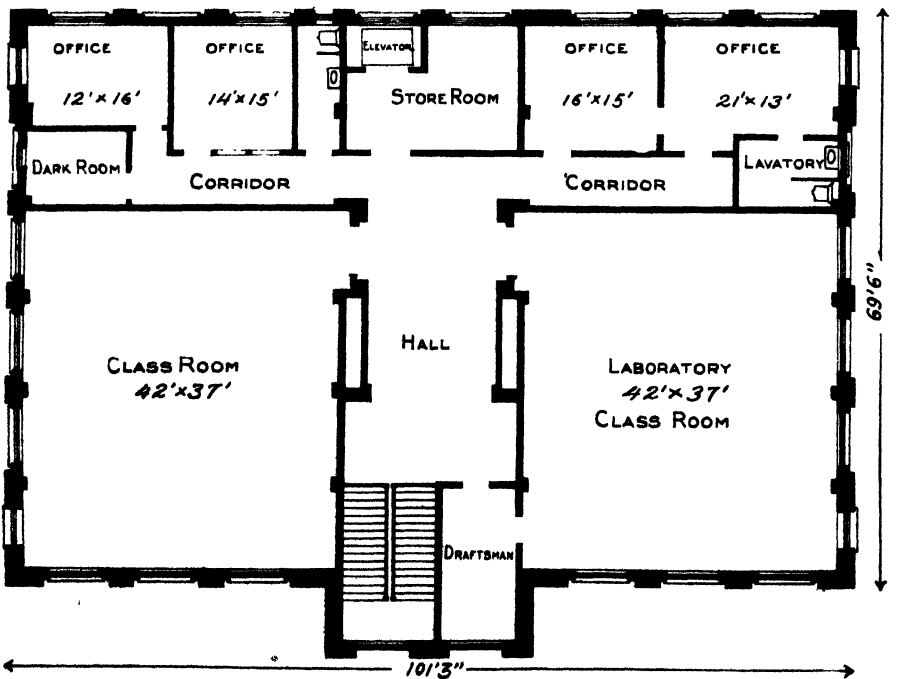
depth of 70 feet with lower storey of stone and upper storeys of red pressed brick, relieved with stone dressings. The roof is of slate with platform of asphalt roofing. Internal partition walls are of tile. The floors of halls and stores are of reinforced concrete slabs, the former finished with 6 by



THE NEW PHYSICS BUILDING, ONTARIO AGRICULTURAL COLLEGE, GUELPH



GROUND FLOOR PLAN



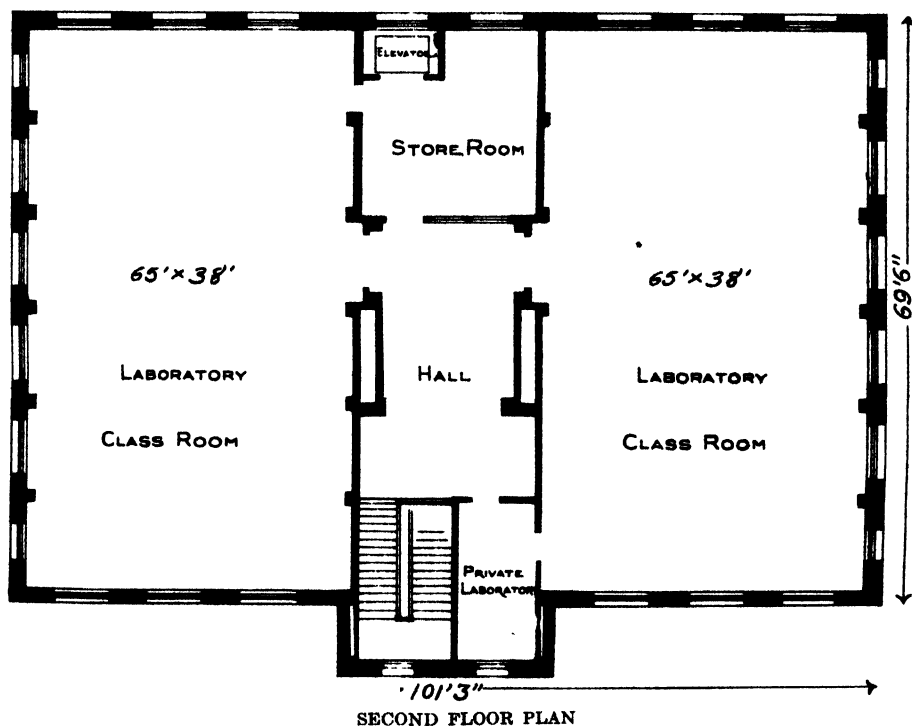
FIRST FLOOR PLAN

6 inch red flooring tile. The stairs are of steel with treads of mastic, giving a fireproof and at the same time noiseless stair. The whole of the trim throughout is of oak, including all furnishings and fittings, all table tops are of birch, all floors, where not fireproof, are of Maple, carried on wood joists, all lavatories are tiled 5 feet high and all walls and ceilings are plastered, except in amphitheatre class rooms, where the lower walls are lined with oak to 5 feet high.

connects up all floors passing up inside of store rooms. There is a store room on each floor fitted with racks for spare apparatus.

The basement is to be used for the testing of various soils and for firing clays and the carrying out of experiments on field drain pipes, etc.

The ground floor consists of two laboratory class rooms, one 37 by 64 feet and one 37 by 42 feet, a private laboratory 21 by 21 feet; student's toilet room 15 by 16 feet and store room 20 by 14 feet. The



The building throughout is heated both by direct and indirect method with thermostatic control. Fresh air is drawn in at the basement by fan and screened and passed over steam heaters and lead to each room in metal ducts and the vitiated air is exhausted by similar ducts and drawn off by fan and discharged at the roof. A freight elevator communicating with the outside and capable of carrying a load of 2,000 pounds

larger laboratory is fitted with nine tables, each to accommodate eight students. Each table is fitted with porcelain sinks with separate water tap and gas jet for each student. The lower part of the table is formed into individual cupboards fitted with galvanized iron drawers for experimental clays and space for test tubes and other apparatus. The smaller laboratory is fitted with a reinforced concrete bench carried on piers from

basement to carry the centrifugal machine without vibration.

The first floor consists of two class rooms each 37 by 43 feet with administrative office and rooms for the professors and lecturers, dark room and store room. One of the class rooms on this floor is fitted up as an amphitheatre with rising seats to accommodate 150 students, and is fitted with individual chairs with folding seats and folding book rests. At one end is a raised platform with demonstration table in front and behind is a sliding slate blackboard 16 by 8 feet ruled off into inch squares. The other class room gives accommodation for fifty-four students working at twenty-seven drafting tables.

The second floor consists of two laboratories 37 by 42 feet, each giving accommodation for seventy-two students working at nine tables, as already described for the large

laboratory on ground floor.

A steel wind gauge tower is carried up twenty feet above a platform on the roof.

The whole of the wood trim was prepared at the Central Reformatory, Guelph, and all the flooring tiles and partition tiles and common bricks were manufactured at the Government Brick Works at Mimico. The building was begun in November, 1914, and, although not completed in every particular, was partially occupied at the beginning of the Fall Session of 1915.

The work was carried out by the Department of the Provincial Secretary, under the supervision of the Department of Public Works. The means for building it, like the field husbandry building and the poultry building described in Volume 1 of THE AGRICULTURAL GAZETTE, were provided from THE AGRICULTURAL INSTRUCTION ACT funds.

DEMONSTRATION-LECTURE COURSES FOR WOMEN'S INSTITUTES

BY GEO. A. PUTNAM, B.S.A., SUPERINTENDENT OF INSTITUTES

THAT women and girls of rural Ontario are anxious to have systematic instruction from trained workers is evidenced by the number of courses that will be given this winter in "Home Nursing, and First Aid", "Sewing" and "Food Values and Cooking". Because of added responsibility on account of the war, many Institutes which had planned to take advantage of the courses offered have decided to wait until conditions are more settled and there is not such a pressing need for patriotic work. In view of the fact, however, that the holding of a course increases efficiency and attracts new members to the Institute, with the result that patriotic work is taken up with all the more enthusiasm when the courses are completed, classes have already been held at 18 points,

while 13 instructors are now busy at other centres. Altogether 49 courses have been arranged for this winter as follows:

Food values and cooking ..	24
Home nursing and first aid..	14
Sewing.....	11
Total..	49

The Institutes are offered a choice of any one of the three courses indicated below:

DOMESTIC SCIENCE

The programme will be arranged after the plan of the Macdonald Institute Short Course in Domestic Science, the lessons including:—

1. Vegetables—Fresh, starchy and dried. Special food functions and methods of cooking.

2. Fruit—Typical methods of cooking; combinations making the best use of home-grown fruits.
3. Milk—Soups, puddings and combinations, with special relation to infant, children's and invalid diet.
4. Cereals and Cheese—Various methods of cooking; their high food value compared with other more expensive foods.
5. Eggs—Correct methods of cooking; variations in methods, storage.
6. Meat—Roasting and broiling; braised dishes, stews, and soups; uses of different cuts, and food value compared with other foods.
7. Baking powder bread, yeast bread and fancy breads.
8. Cake and little cakes.
9. Puddings and desserts.
10. Salads.

The instructor may substitute other lines of work for one or two of the lessons announced if thought desirable.

HOME NURSING AND FIRST AID

Throughout the course the pupils have practical work in reading the clinical thermometer, counting pulse and respirations. The keeping of a chart is also taken up; this consists in keeping a simple exact record of the various things mentioned thereon.

1. Sick Room—Sanitation, ventilation, care, etc.
2. Bed-making for various forms of sickness.
3. The bath.
4. Emergencies.
5. Hot and cold applications.
6. Bandaging.
7. Disinfectants and observations of symptoms.
8. The administrations of food and medicine.
9. Baby hygiene.
10. Review and general discussion.

If the institute members so desire, the instructor will give a few special talks or lessons to the older girls in the school as well as to the young girls of the neighbourhood. Classes of at least fifteen girls should be formed before this special work is undertaken. The lessons can be ar-

ranged for the forenoon or late afternoon, and no additional charge will be made. The institute must provide the necessary hall, well-lighted, heated, etc.

SEWING COURSE

Two lessons on plain and fancy stitches including button-holes and eyelet.

Two lessons on tailored skirt.

One lesson drafting and cutting.

Three lessons on one-piece dress—fancy.

Two lessons on one-piece dress—plain.

In arranging for and holding classes the Institutes will be required:—

- (a) To make application to the Superintendent of Institutes for the course desired on the form supplied.
- (b) To provide a well-lighted, clean, properly heated and ventilated hall suited to the work undertaken.

(c) To guarantee classes of the following numbers:—

1. Domestic Science—Minimum of 25, and the class may be as large as the hall will accommodate.
2. Home Nursing and First Aid—Minimum of 25 and the class may be as large as the hall will accommodate.
3. Sewing—15 to 18; or if two classes desired 30 to 36. Not more than 18 will be instructed at the one time.

(d) To provide supplies as follows:—

1. Domestic Science—Table, stove (gas or coal oil), the materials to be used for demonstration purposes. Most of these are usually brought by the members of the class; if all are purchased at the regular rates the total cost should not exceed \$2 or \$3.

2. Home Nursing and First Aid—The necessary bandages, etc., will be provided by the instructor.

3. Sewing—A considerable amount of table space is required, three feet wide and about two feet deep for each person, three or four sewing machines—these, in most cases, will be loaned by the members of the Institute, or possibly a local agent will be glad to furnish them.

(e) Collect fees as follows:—

"Domestic Science" and "Home Nursing and First Aid"—25 cents from each member of the Institute and 50 cents from non-members. The money thus collected will be used to defray expenses in connection with the course.

"Sewing"—\$1.25 from Institute members and \$1.50 from non-members. One

dollar for each member of the class must be mailed to the Superintendent of Institutes immediately after the second lesson is given. The extra 25 cents or 50 cents from each member is to be used in defraying expenses in connection with the course. In all cases the money on hand at the conclusion of the course shall be placed in the Institute treasury. The 25 cents extra charge to non-members entitles them to membership in the Institute for the current Institute year.

The regular Institute money is not to be used to pay expenses in connection with these courses. If the fee announced in the foregoing is not sufficient to cover local expense, then the members of the class must make up the amount.

(f) Appoint a committee to secure hall, see that it is properly cleaned, heated and ventilated, and to secure the necessary supplies. The secretary of the committee shall collect fees, keep an exact account of expenses, and present a financial statement to the members of the class at the conclusion of the course. The secretary shall also be required to keep a record of attendance at each of the lessons. At the conclusion of the course she shall furnish a report upon attendance, finances, etc., to the Superintendent of the Institutes branch. The secretary may be paid for her services in connection with the class in accordance with the wishes of the members. We would suggest 5 to 10 per cent of the amount collected from each pupil be paid to the class secretary for her services.

There is no charge for instruction except in the case of sewing courses, when each member is required to pay one dollar to the Department. The small fee of twenty-five cents for Institute members and fifty cents for non-members, is collected to defray incidental expenses such as heating of hall, furnishing supplies, etc. In some cases printed announcements are prepared and distributed. The following is taken from one of the most attractive advertisements:

INTRODUCTION

"WE have no doubt at all that every woman and girl in this district is desirous of doing everything possible to lighten the burdens brought on by the war;

"WILL you then not increase your efficiency by getting into closer touch with

the relation of science to your every day duties?

"Do you know that the best housekeepers in this country are those who lose no opportunity of improving their talents?

"OUR opportunity is here. The purpose of offering this course is not so much to teach the class how to cook as to give them an opportunity of making a systematic and intelligent study of why to cook;

"DUTY demands that we make the very best use of our energies in this day. Arrange at once to take a couple of hours a day for the study of domestic science. A short outline of the course is submitted for your approval. A specially qualified instructor will be supplied by the Provincial Institute Branch."

Library boards, school boards, church officials, town and township councils, show a willingness to place suitable rooms and halls at the disposal of the Institutes for this work, free of cost.

At a number of centres, short courses in agriculture, under the direction of the District Representatives of the Department of Agriculture, and demonstration-lectures to the Women's Institutes, are being held at the same time. Instruction of special interest to the girls is given in the forenoon at the domestic science classes, and both the grown-ups and the girls take advantage of the afternoon classes, the morning's work supplementing the afternoon instruction. It is not only that the young people are getting valuable instruction, but they are being won over to intelligent thinking in these classes. It is a beginning of what promises to develop into a very important feature of up-to-date instruction for the women and girls in the rural district.

Surely the value of the instruction given and the appreciation on the part of the women and girls taking advantage of the course will result in that public opinion which will not be satisfied until vocational training shall be a part of the educational advantages of all our rural districts.

SASKATCHEWAN

THE PATRIOTIC ACRE SCHEME

BY S. W. YATES, SASKATCHEWAN GRAIN GROWERS' ASSOCIATION, MOOSE JAW

THE Patriotic Acre Scheme of the Saskatchewan Grain Growers' Association is undoubtedly one of the biggest things ever carried through by the farmers of the West, and is attracting attention not only throughout this vast continent, but also in the motherland for which this great gift is intended. It is indeed one of the finest expressions of loyalty that one can conceive, being as it is an absolutely voluntary gift, in many cases by men who for the last year or two have suffered heavy losses by drought, hail and other natural causes, and who had thus a legitimate excuse, had they cared to seek it, for declining to carry out their promises. To their honour, however, many of these men have not only given their acre, but they have even given more than their acre has yielded, in order to be even with their more fortunate neighbours.

The idea originated with Mr. T. M. Morgan, a director of the association, who communicated it to Mr. J. B. Musselman, central secretary of the Saskatchewan Grain Growers' Association, by whom it was brought to the notice of the executive; meeting with their approval, it was brought before the delegates at the annual convention at Regina in February, 1915, and was adopted with the greatest enthusiasm.

For the better carrying out of the scheme, a form was drafted, of which 30,000 copies were printed, each in duplicate, and these were sent out in large numbers to local associations in all parts of the province. These forms bear the union jack and ensign in colours with the emblem of the

association,—a wheat sheaf in the centre, surrounded by the words, "Saskatchewan Grain Growers' Association."

The form of pledge ultimately adopted was drafted with the greatest care, it being distinctly stated that the form is not a promissory note, so that no farmer need fear any form of compulsion being applied in case circumstances render it impossible to carry out his pledge.

Many interesting features have been brought to light as these forms have been returned to the central office. The nationalities of the contributors, for instance, are most varied, forms having been signed by Englishmen, Americans, Scandinavians, Russians, Roumanians, Austrians, Frenchmen, Germans and others, and in this connection it may be stated that from one district there came forty forms, all of which, with one exception, were signed by natives of Eastern Central Europe, the majority being Austrians. It is also interesting to note that the first actual contribution received was from a German.

Each farmer, under this scheme, was invited to contribute the proceeds of one or more acres. As a matter of fact, however, each farmer has been left free to make any contribution he desires, and as a consequence the amounts promised have varied from as low as 50c. in cash to the product of ten acres of wheat. The largest contribution is that of Isaac Sterling, of Nashlyn, who contributed 400 bushels of wheat, the product of ten acres at an average of 40 bush. per acre. The next largest contribution is that of Chas. McCarthy of

Prairie Star local, who gave the produce of five acres. viz., 189 bushels, an average of 38 bushels per acre. The largest cash contributor is Wm. A. Kennedy, of Conquest, who sent in a contribution of \$154; the second largest being Clarence Heron, of Ogema, with a contribution of \$135.

Up to the present time, the actual contributions, as distinct from promises, amount to 56,000 bushels of grain and over \$15,000 in cash, which is equivalent to nearly three million pounds of flour.

All wheat contributed to the fund is being handled by the various elevators free of charge, while the milling of the flour will also be done by one of the largest mills in Saskatchewan at practically cost price. The banks are also co-operating by putting through all cheques at par. The flour will be put up in sacks bearing the emblem of the association, and, when milled, will be transported to the coast, it is anticipated, at a min-

imum cost to the fund.

The co-operation of the Dominion Government has been secured and Sir. Geo. E. Foster, Minister of Trade and Commerce, has guaranteed free transportation across the Atlantic to Great Britain.

Far as the season has gone, circumstances are such as to make it impossible to forecast with any degree of certainty what will be the total contribution to this great fund. At the present time we are making an effort to get in all forms so as to arrive at the number of acres promised. At the time of writing we have promises of 6,000 acres, nearly one-half of which have been actually redeemed. It is now certain, however, that the result will be one which will bring honour to the farmers of Saskatchewan, and prove to the world that these sons of the soil are doing their duty to the Empire as truly as though they had offered their lives for their country in the trenches of Flanders or Gallipoli.

CONTEST IN THE RAISING AND FEEDING OF SWINE

A contest in the raising and feeding of swine for the Boys' and Girls' Club of Weyburn, R. M. 67, in the Weyburn inspectorate has recently been announced by Mr. A. Kennedy, M.A., district school inspector. One hundred dollars in prizes for the successful competitors, has been contributed by Mr. J. A. McBride, president and managing director of the Golden West Grain Company, Limited. The purposes and rules and regulations of the contest follow:

The purposes of the contest are:—

1. To stimulate an interest in the production of swine;
2. To encourage a study of the problem of raising and feeding swine with a view to securing the best results and the largest profits;
3. To awaken a recognition of the importance of desirable types of live stock;

4. To instil a love of animals with a view to creating greater interest in farm life.

The rules governing the contest are:—

1. Boys and girls up to eighteen years of age (before December 31st, 1916), living in Weyburn R. M. 67, or in any school district, a portion of which lies within Weyburn R. M. 67, or living in the following school districts—Waverley S. D. 1318, Prairie View S. D. 960, Lily Glen S. D. 1504 and Prairie Centre S. D. 1271—shall be eligible for membership in the Club.

2. Each competitor must submit an application for membership, without fee, on the form provided, before March 15th, 1916.

3. Each competitor must feed and care for a litter of pigs farrowed in 1916, from weaning time up to the date of final judging on or about October 1st, 1916.

4. Each competitor must exhibit the litter at the Fair to be held under the auspices of the Weyburn Agricultural Society in Weyburn on or about August 1st, 1916, at which time the second judging will be made.

5. Each competitor must have the litter ready for a first judging at a time, to be decided upon later, during May, 1916.

6. Each competitor must keep a complete record of the litter, including dates, weights, feeds, rations, expenses connected with housing, pasture, feeding, sale, etc., and receipts.

7. The first judging will be made on the general appearance of the litter and the provision made for housing and feeding; a maximum score of 50 points will be assigned for the judging.

8. The second judging will be based on the results of the awards made by the official judges of the fair; a maximum score of 75 points will be assigned to this judging.

9. The third judging will be based on the market value of the litter; a maximum score of 100 points will be assigned to this judging.

10. A maximum score of 75 points will be assigned to the records submitted at the time of the third judging.

11. In so far as possible, the contest must be conducted along the lines of actual ownership and personal management as in actual life on the farm. It is hoped that parents of the competitors will guarantee that the management and care of the litter will be left to the competitors.

12. Competitors will be permitted—in fact, encouraged,—to obtain information from the Department of Agriculture, College of Agriculture, Farm Journals and other similar sources open to farmers.

THE DUTY OF THE DOMINION

What then are we to do at home? We are told that the war is to cost Canada \$500,000,000. Who will pay it? It is said that the financial burdens of the war will last fifty years. It will be well, therefore, for this country not to organize itself simply to send men to the front to carry the war to a successful issue, but to organize itself so that Canada may assume her place with the other Dominions to take advantage of what victory will accord us.

When the war is over agriculture must be in a far stronger position than when hostilities commenced. In Britain agriculture is a growing asset. Their flocks are greater, their acreage under cultivation is greater. Will we be doing our duty if we do not set ourselves to the same task? The making of the agricultural industry is of national importance. In this task, the Canadian National Exhibition Association can render a valuable service by encouraging competition and interest in agriculture by arranging its prize lists, etc., accordingly. By enlarging and maintaining the stability of agriculture you will be doing your duty to the city, the province and the Dominion.

Dr. C. C. James, before the Canadian National Exhibition Association.

PART III

Rural Science

THE BEAUTIFICATION OF SCHOOL GROUNDS

"A few rural districts have shown a creditable interest in beautifying their school grounds, but the movement is not at all general. One too often sees the school grounds unfenced, ungraded and littered with paper, chips, etc."

THE above quotation from the Public School Report for British Columbia for 1914 leads to the conclusion that there is need of an awakening, throughout the rural districts, to the importance of beautifying school grounds. This movement, not necessarily associated with school gardening, would seem to require all the encouragement that can be given to it. For the information of rural educationists throughout Canada, provincial authorities were asked to treat the subject under the following heads:—

1. The provision made by the Department to encourage and assist in the beautifying of school grounds.
2. The attitude of the rural school districts toward this question.
3. Examples of local methods that have been successful in enlisting the sympathy and co-operation of the teachers, trustees, parents and pupils.

PRINCE EDWARD ISLAND

BY H. H. SHAW, ACTING SUPERINTENDENT OF EDUCATION, CHARLOTTETOWN, P.E.I.

FROM the reports of the school inspectors so far received, there is evidence of a growing interest in the improvement of the school premises. It is shown chiefly by improvement in the buildings and fences. The attitude of the rural school districts towards this question in the past has been largely one of indifference. The

introduction of school gardens has called for fencing of the grounds, which in general has been done with a view to improving the general appearance of the school property; and it has proved to be the means most successful in enlisting the sympathy and co-operation of teachers, trustees, pupils and parents.

NOVA SCOTIA

BY A. H. MACKAY, B.A., LL.D., SUPERINTENDENT OF EDUCATION

THE provisions of the Department of Education for the beautifying of school grounds in Nova Scotia are set forth in the

Educational Statutes and Regulations bearing on this subject. The following extracts taken from these regulations will indicate the attitude

and provision for the beautification of our school sites:—

The purchase or improvement of school sites or grounds.

The regulations of the Council of Public Instruction make it the duty of every teacher in the public schools to give assiduous attention to the health and comfort of the pupils, to the cleanliness, temperature and ventilation of the school rooms, to the æsthetic condition of the rooms, grounds and buildings.

The following Regulations refer especially to school sites and grounds:

The school house with its grounds is a very true index of the general public spirit and intelligence of the school section. Being the common centre of habitation for a large portion of the day of that part of every family naturally drawing forth the deepest emotions of affection and interest, the character of the school house and its environment must substantially reflect the sentiment of the community. Here we should expect to see the accumulation of efforts constantly made from year to year, embellishing grounds at first selected for their convenience, salubrity and beauty of position, and adding to the useful apparatus and general equipment of the school room originally constructed with a view of healthy, physical, intellectual, and moral development. The people should have reason to be proud of their school house, which should bear on its front the name of the school and the year of its erection. The following directions are intended more particularly for rural schools.

School Sites—In selecting the site for a school house the trustees should see that the following conditions are fulfilled as far as possible. It should be from 50 to 150 feet from any public highway, and should be far removed from railroads, mills, factories, taverns, noisy surroundings, stagnant pools, swamps, or noxious effluvia or influences from any source. It should have a dry, airy position, with a gentle slope and southern exposure if possible, and command as attractive a prospect as natural facilities will permit.

School Grounds—In rural sections the grounds should contain, when convenient, *one acre*, never less than half an acre; in thickly peopled localities, or villages, *half an acre* or more, but never less than *one-third*; and in towns never less than *one-quarter*. The site should be properly levelled, drained when necessary, neatly fenced around, ornamented with desirable

shade trees, which should neither interfere with the play-grounds nor the light of the school room. Within the grounds, or near the grounds, there should be an area for cultivation as a "school garden" to serve for the objective study of nature and for practical training in the rudiments of such arts as agriculture, horticulture or forestry.

AESTHETIC ENCLOSURE

In the *Journal of Education* from year to year instructions are given with respect to the æsthetic enclosure, planning and care of the school grounds. The following quotation from the last *Journal* is an example:—

"A large school garden is, in most cases, not advisable. A small demonstration plot is a good thing, for there the teacher can give instructions that are to be carried out in the home gardens. But every school can beautify its grounds to some extent. If your grounds are rocky, plant beds of portulaca or such vines as wild cucumber and Virginia creeper. These will soon cover the rocks. Where possible have a border six feet wide plough along one side of the school grounds. Choose the side where the soil is best; and keep in mind the possibility of cattle reaching over the fence to eat the shrubs. If you plant next a pasture fence, don't put anything within three feet of the fence. Horses can reach even farther than that. Thorny shrubs, such as hawthorn, barberry, or Japanese rose, are good to plant along pasture fences. Plough the border this fall as early as possible. In a later issue of the *Bulletin* we shall suggest flowers for spring planting.

"In all your garden work ask advice of a few optimistic farmers. Don't consult those who have a grouch against the world. Their advice is always destructive.

"If any rural science teacher will, before Christmas vacation, collect from her children or section two dollars for seeds and shrubs the Rural Science department will donate another two dollars and order the supplies. When sending the money to Truro, give particulars about the location of your border. Say whether it is sunny or shaded; sheltered or exposed to winds; along a pasture fence or not.

"This financial assistance is given with the understanding that the teacher is making some provision for the care of the plants during the summer vacation. Weeds must be kept down."

QUEBEC

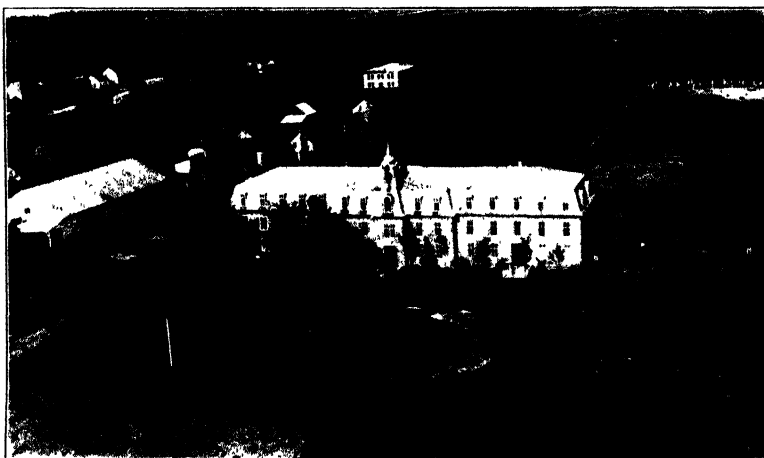
BY JEAN-CHARLES MAGNAN, AGR., SAINT-CASIMIR

WE are pleased to see that the Editor of THE AGRICULTURAL GAZETTE is giving special attention to this very important question of the improvement of school grounds.

Too many school gardens are not fenced nor graded; some are covered with refuse of all kinds, papers, chips, etc. The extract, quoted in the introduction to this subject, from a report of the public schools of British Columbia, may also apply to some of our schools.

fixed a date for an "Arbor Day", stated the advantages and utility of trees and urged school boards to plant trees in school grounds, and he counted on the devotion of the trustees and on their patriotism to fulfil this pleasant and useful task.

In addition, the school inspectors also gave lectures on the subject to the school trustees and to the teachers at the annual meetings. Last year a special circular on the subject was distributed by the Department of Agriculture to all the schools of the



VIEW OF THE ACADEMY OF THE SACRED HEART AT STE. ANNE-DE-LA-PÉRADE, AFTER IMPROVEMENT TO THE SCHOOL GROUNDS IN 1915

However, for the last few years the departments of Education and Agriculture have been co-operating in an endeavour to improve our school grounds and they have obtained good results.

Among steps that have been taken, mention should be made of a special circular addressed in April, 1912, by the Hon. Superintendent of Public Education to the school commissioners and trustees. A previous circular, however, was addressed in June, 1911. In this circular, the Superintendent

province, through the review "Elementary Teaching."

The attitude of the school boards and the teachers with regard to the improvement of the school grounds is very encouraging. I have received during the past year, 114 letters from teachers, asking for circulars and pamphlets on tree planting and the care of flower gardens. A number of schools also asked for information regarding the purchase of ornamental trees and shrubs for the advancement of the school gardens.

It should also be stated that a large number of fruit trees and ornamental trees have been planted in most of our domestic science schools. Among the country schools that have planted the larger number of trees and shrubs the following deserve to be mentioned: The Academy of Brothers of Christian teaching at Saint Casimir, where 67 trees and shrubs have been planted, and the Academy of the Sacred Heart at Ste. Anne de la Pérade, where the grounds on the west side have been greatly improved.

The local methods that have been used to facilitate the improvement of the school grounds and to secure the good-will of the teachers, trustees, parents and pupils, have been the following: Visit of the school garden by the district representative and by the school inspectors, who give practical instruction and advice; distribution of circulars and pamphlets, organization of school garden clubs to facilitate the task of the teachers and trustees. The improvement of school grounds has also been strongly recommended at the provincial school fairs.

MACDONALD COLLEGE

BY J. E. MCOUAT, B.S.A., RURAL SCHOOL DEMONSTRATOR

IN the January issue of THE AGRICULTURAL GAZETTE there was published a short article outlining the objects of the Rural School Department of Macdonald College recently organized to render assistance to the Protestant rural schools of Quebec.

As indicated in that article one of the chief objects is to aid in every possible way the beautification of rural school grounds, not only of the small elementary school situated in the heart of the country, but also of the village and town school which cater to the intellectual needs of pupils from rural homes.

There can be no doubt as to the need of such assistance, for the grounds upon which any artificial improvement has been made are very few in number, and the field for work along such lines is indeed great.

In order to assist this work in the most practical way the College has arranged to have the shrubs, vines, bulbs and flowers needed for such improvement, provided at the lowest possible rate. This is facilitated to a great extent through the co-operation of the Horticultural Department of the college, which renders hearty as-

sistance in this work. The authorities have also offered to see that, whenever possible, such material is planted on the grounds under the personal supervision of the rural school demonstrator or a member of the horticultural staff.

Provided with these offers of assistance the demonstrator visits the schools boards of the various schools, and confers with them as to improving their grounds. Before such conferences a visit is paid to the school grounds, and an idea obtained as to the amount of work and material required to bring about the desired improvement. If the board desires to beautify the school surroundings, it is asked for a small grant to defray the cost of the material, or at least part of it. The board is also expected to provide assistance at the time of planting, such as furnishing a team with a plough, or a supply of fertilizers.

In some localities a meeting of the public is held; the proposition is laid before the meeting, and an opinion asked for upon the question. This has proved to be a very good plan of action, for if the people of the community wish such improve-

ment the authorities are much more likely to act when they know the public desire.

The attitude of the rural school districts is, on the whole, all that could be desired. In fact the enthusiasm with which the offers of assistance have been received has been surprising and gratifying. One of the secrets of success in this work is to appeal to the progressive spirit of the community and to enlist the co-operation of teachers, pupils, the public and the school boards.

The work in this province has only begun, and so we cannot point as yet to a great deal of improvement. There are already, however, more communities desiring assistance than the Department can easily aid, and the question to-day is not so much how can we get school grounds to improve, but how can we best attend to those already placed in our hands for improvement.

This statement is not made in a boastful mood, for it really shows the very poor condition of our grounds when there is so much to be done, and reveals the neglectful attitude that has prevailed in the past. It also illustrates, however, that our rural communities are progressive and eager for self improvement when the situation is brought to their notice, and the possibilities of making changes for the better made clear.

We are only starting this work, and the field for such endeavour is large; but the efforts of the next few years should bring about a great improvement in the surroundings of our rural schools.

In the meanwhile we shall doubtless make many mistakes, but experience teaches, and, besides, we shall look to our sister provinces, some of them more experienced, in such work, for guidance and assistance.

ONTARIO

BY J. B. DANDENO, INSPECTOR OF ELEMENTARY AGRICULTURAL CLASSES

THE Ontario Department of Education makes no special provision for the beautifying of school premises and grounds, but is encouraging it indirectly very materially in several ways. The Department provides for the introduction and maintenance of school gardens, and for classes in agriculture in the schools of the province, as an option. Wherever these classes have been undertaken seriously, and especially where the school-garden work has been carried on, the improvements in the grounds have been most marked and gratifying. Between 300 and 400 rural schools have been made ever so much more attractive than they were, by the introduction of the teaching of agriculture.

The trustees of such school sections are being brought into closer

touch with the school-work, and their effort has contributed not a little to the success. A healthy pride in the school soon develops, and other rate-payers are led to take further interest in the surroundings of the school.

The rural movement in Ontario aims to make the rural school a social centre as well as an educational centre, and, if the right kind of teacher can be secured, improvement in grounds is bound to result. More land must be secured, not only for garden, but also for play-ground, tennis-courts, etc.

The young men and the young women of the section are the most powerful factor in the section, and this factor too often has not been used. Young people's socials, games, etc., should be encouraged,

and the help of those young people should be secured by the teacher.

Beautifying school grounds will never be accomplished by simply

telling the teacher and trustees to do so. It is expected to be brought about largely by the school-garden movement in Ontario.

MANITOBA

BY H. W. WATSON, M.A., DIRECTOR OF ELEMENTARY AGRICULTURE

THE Department of Education for Manitoba considers the beautifying of the school ground an important part of the school's activities. A grant to the extent of \$25 may be paid yearly to the teacher who does satisfactory work along this line. During the past

39,000 windbreak seedlings. Free.
10,514 trees and flowering shrubs, and
1,743 perennial roots. Wholesale cost.

Some schools have had very little success with their planting owing to the imperfect preparation of the ground and the lack of proper cultivation afterwards.



SCHOOL GROUND AND GARDENS, MELITA, MANITOBA

three years the Department has endeavoured to encourage and assist teachers and school boards by furnishing material for such purposes. The following material has been distributed upon application:

The schools that have been most interested in the beautification of grounds are:—Stonewall, Teulon, Selkirk, Beulah, Warren, Glenella, Minto, Rathwell, Pilot Mound, Reston, Rossburn, Russell, Clagg,

Tummell, Starbuck, Solsgirth, Gunton, Sifton, Napinka, Winkler, Melita, Gilbert Plains, Virden and Elkhorn.

Practically all of the school inspectors report a great improvement in the external appearance of

some of the schools that have held such days:—Winkler, Gilbert Plains, Warren, Starbuck, Glennella and Teulon. The grounds had been planned and the soil well prepared the previous summer. Trees, shrubs and perennial roots were ordered in



THE FIRST SEASON'S IMPROVEMENT, SCHOOL GROUND, SIFTON, MANITOBA

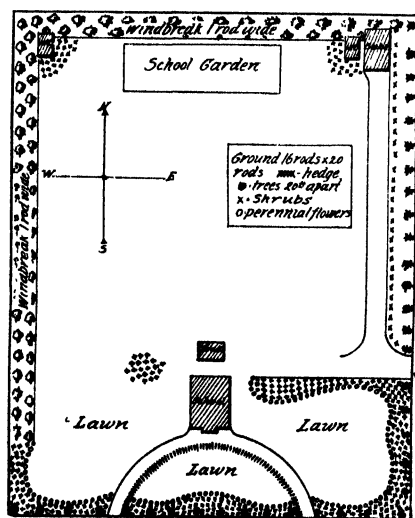
the school buildings and in the school sites generally during the past year. One inspector reports that the grounds of almost all the village schools and of about 20 per cent of the rural schools have been improved during the year.

Most school boards recognize the necessity of making the school buildings and their surroundings as attractive as those of the best homes of the district. Some boards display even a greater interest than the teachers and begin the work upon their own initiative. During the past three seasons many boards have requested the assistance of the director of school gardening in laying out grounds, and in giving suggestions as to the selection of material.

The most effective work has been done by the teachers and pupils enlisting the co-operation of the trustees and parents in a general clean-up and tree-planting day. This is generally held on Arbor Day, or on a later and more suitable date. The following are

time to be on hand. The teacher, knowing what to plant and when to plant it, directed the operations.

The enthusiastic teacher, who plans well and enlists the co-operation



A WELL PLANNED TWO-ACRE SCHOOL GROUND

of the trustees and some of the parents, may have a wonderful improvement made in a few hours. The work then, however, is merely commenced; much of the money and labour will have been wasted without

constant cultivation and watering during the prolonged drought. The work in connection with cultivation and the necessary watering is generally done by the caretaker or some other person employed by the trustees.

SASKATCHEWAN

BY A. W. COCKS, B.Sc., DIRECTOR OF SCHOOL AGRICULTURE

IT is generally admitted that most of the rural school grounds on the prairies are very desolate and uninviting in appearance. In many cases no attempt has been made to improve conditions, and with the exception of the school building there is nothing to indicate any effort on the part of man to change the natural appearance of the prairie. Although the cultivation of trees and shrubs is a fairly simple matter yet



TREELESS SCHOOL GROUNDS ON THE PRAIRIE

this fact is not generally known and many school trustees and ratepayers on the prairies are of the opinion that it is useless to attempt to establish windbreaks, shelter-belts or tree plantations.

Recognizing the necessity for more beautiful surroundings for rural schools the Department through its directors of school agriculture and inspectors of schools is doing everything possible to encourage trustees and teachers to cultivate the grounds and to plant trees and shrubs. Ar-

rangements have been made with the chief of the Tree Planting Division, Forestry Farm, Indian Head, and with the Provincial Nurseries Regina, for the free distribution of trees and shrubs to school districts. The school officials are asked to properly cultivate the ground, to make application for trees and shrubs at least a year before planting and to submit a complete statement of the work done on the land, a plan of the school grounds and an agreement to properly care of the trees and shrubs after planting. Applications are forwarded and the above information supplied to the directors of school agriculture, who, by inspection of the ground or otherwise, will satisfy themselves that the ground has been properly prepared before forwarding the list of applications to the Forestry Farm or the Provincial Nurseries.

To further assist rural school trustees and teachers in the laying out of the grounds, the planting of trees and shrubs and the subsequent care of the same a bulletin entitled "Tree Planting for the Schools of Saskatchewan" was published and distributed to every school district in the province some time ago. At the present time another bulletin containing several plans for school grounds is in course of preparation and will also be distributed during the spring. The directors of school agriculture will give assistance and advice whenever the same is requested or possible.

By the number of applications for trees being received it would appear that school officials

throughout the province are realizing the importance and the need of more beautiful surroundings for their schools. There is, however, a tendency to attempt to obtain results too quickly and because of this there

tion of all surface growth, and the second to summer fallowing.

By means of lantern lectures which illustrate the possibilities of tree planting on the prairies, by the distribution of literature on the subject,



PUBLIC SCHOOL GROUNDS, INDIAN HEAD, SASKATCHEWAN

is considerable loss of energy, time and trees. On the prairies of Saskatchewan it is absolutely necessary that two seasons should be devoted to the preparation of the ground, the first season being devoted to the breaking of the sod and the destruc-

tion and by public meetings the officials of the department hope to arouse the interest of all trustees and teachers who have not yet attempted to improve the appearance of the school grounds.

BRITISH COLUMBIA

BY J. W. GIBSON, M.A., DIRECTOR OF ELEMENTARY AGRICULTURAL EDUCATION

SINCE the introduction of public school systems in Canada, great progress has been made in the direction of improved accommodation in the way of buildings and school-room equipment. Better books at lower cost have been provided, courses of study have been revised from time to time to meet the demands of an ever-changing and advancing conception of educational needs and ideals, and more attention is now being given to the training of teachers in preparation for this great work of instructing and developing the young. Formerly the great function of the teacher was held to be the giving of instruction which, unfortunately, was too often narrowed down

to mean the imparting of information. This placed the main emphasis upon subject matter and text-books. In later years there has sprung into existence a science of education which places great stress on mental processes and the educational principles involved. This has given prominence to method rather than to subject matter in education, and finally, as method presupposes various lines of procedure in dealing with different subjects and also with different children, we have arrived at that stage in our educational evolution where the real, living child comes into view—the hope or despair of every teacher.

We have been a long time coming

to realize that the intimate personal and permanent good of each boy and girl affords the only possible justification for our lavish expenditures on fine buildings, with their wealth of modern equipment, as well as upon expensive sites for their location. We are living in what may come to be known as the "Children's Century". We are thinking more than ever before of *their* future needs and of *their* present requirements in order to meet those needs. We are not only concerned with what they may know and be able to do, but also with what manner of men and women they will presently become.

With this vision of education as a preparation for life, we are brought face to face with the great problem of environmental influence. What the child does out of school—how he spends his leisure hours at home as well as in the school ground and athletic field—demands as careful consideration as how he occupies his hours spent in the class-room. The hours spent out-of-doors are or should be hours of pleasureable and purposeful activity, and yet how few school boards have given the same attention to the providing of congenial surroundings for the children in their school grounds that they have so well and wisely provided in the class-room. All who are closely in touch with child life will agree that the outdoor occupations of children if properly conducted contribute alike to mental alertness, moral strength and physical fitness.

But there is another important way in which well-appointed school grounds can and do exert a beneficial influence on child character. I refer to beauty and harmony as exhibited in the planting of trees, vines, ornamental shrubs and flowers in the school grounds. In British Columbia our purpose is to increase the use-

fulness of school grounds from an educational standpoint as well as from the standpoint of games and athletics, and, at the same time, to so enhance their appearance as to make them the pride of those communities wherein they are located.

DEPARTMENTAL ASSISTANCE

To this end the Department of Education for this province has arranged to give assistance to school boards in the matter of advice as well as by way of financial support. In a circular issued by the Department a year ago, the nature and extent of this assistance were fully outlined, which reads in part as follows:—

"Because of the fact that the school grounds in the great majority of the schools of the province are quite below the standard of excellence of the school buildings, and in order to encourage trustee boards to improve the school grounds of the province, the Department has decided to make certain special grants which will be conditional upon the expenditure of equal amounts by each school board concerned. The grants referred to are not for such essential preliminary work as logging, stumping, rough-grading, and fencing, but for such subsequent improvements as draining and fine-grading preparatory to seeding and planting the grounds. Besides helping to defray the expenses connected with materials and labour required in the draining and fine-grading of the grounds, this grant may be used in purchasing lawn-grass seed, flower seeds and plants, ornamental shrubs, vines and trees; for top-dressing and fertilizing lawns, flower borders or shrubbery, and for irrigation if necessary. In all cases the teachers and pupils are expected to co-operate with the school boards in connection with the planting and care of the grounds."

The amount of the grant given for this purpose depends upon the size of the grounds and the number of rooms in the school usually occupied. No grant is allowed towards the improvement of grounds less than one acre in extent. The following table gives the maximum departmental grant in each case:—

(1)	School with 1	or	2	rooms, minimum area of grounds: 1 acre.....	\$125.00
(2)	"	"	3	or 4 " " " 1½ acres.....	175.00
(3)	"	"	5	or 6 " " " 2 "	225.00
(4)	"	"	7	or 8 " " " 2½ "	275.00
(5)	"	"	more than 8	" " " 3 "	350.00

School boards wishing to avail themselves of these grants for the purposes above stated must have plans of the grounds prepared and forwarded to the department. They may also appoint a grounds committee to confer with the Director of Elementary Agricultural Education in deciding upon the most desirable improvements to be carried out in each case. This approved scheme of improvement must be carried out within two years from the time of its initiation. The grants are paid on the receipt of a signed statement of expenditures from the board, and after inspection by the director, or other official authorized by the department.

Following this initial grant towards the improvement of school grounds, annual maintenance grants are given by the department towards the upkeep and continuance of the work. According to the inspector's grading of the grounds will be the amount of the grant allowed, and all moneys so granted must be used exclusively for this specific work of grounds improvement and beautification. According to the condition of the grounds they will be graded by the inspector A, B or C, and grants for maintenance allowed as follows:

	Grade A	Grade B	Grade C
One-room school ..	\$15.00	\$10.00	\$ 5.00
Two-room school...	24.00	16 00	8 00
Three or four-room school.....	33.00	22.00	11.00
Five or six-room school.....	42.00	28.00	14.00
Seven or eight-room school....	51.00	34 00	17 00

A SCHOOLS' NURSERY ESTABLISHED

A very important feature of this scheme for the beautification of school grounds is the establishing of a provincial schools' nursery. Here suitable native as well as imported varieties of trees, ornamental shrubs and herbaceous perennials are being propagated in large quantities from

seeds and cuttings, for distribution to those schools undertaking a definite scheme of improvement. Several schools have already been supplied with planting material from the provincial nursery and others are being supplied this spring.

THE PROGRESS MADE

The attitude of rural school districts towards this movement to beautify school grounds has been most encouraging as has also been the interest shown by school boards in urban districts. Up to the present time this work has been started in seven rural and assisted schools, fourteen rural municipal schools and twelve city schools. This number would have been much larger if it were not for the great financial stringency which, unfortunately, is so general throughout the province at the present time. It is altogether likely that the Department will find it necessary to place a limit on the number of schools undertaking the work under the present scheme of grants. I have received many expressions of commendation in connection with this line of school ground improvement work, not only from school trustees, but also from Farmers' and Women's Institutes in the province, and from many private individuals.

We have not found it necessary even under present adverse financial conditions to carry on a special campaign throughout the province in order to stimulate school boards to undertake this improvement work. A number of illustrated lectures dealing with the subject have been given in different parts of the province, and a number of conferences held with boards of school trustees. The school inspectors and the teachers themselves are rendering excellent service in encouraging this work as well as that of school gardening. We need only more time and a little more money to make this work really effective in every part of this large province.

NEW BRUNSWICK

SCHOOL FAIRS

BY R. P. STEEVES, M.A., DIRECTOR OF ELEMENTARY AGRICULTURE

AT the time of the advent of the school garden movement in New Brunswick, as far back as 1904, exhibits of school garden products were made at provincial, county and agricultural fairs. In many cases prizes were awarded for these. The Kingston Consolidated, Sussex, Hampton Consolidated, Woodstock schools and others were exhibitors. More recently St. Stephen and Moore's Mills have been annually exhibiting at the county fair in Charlotte county. No concerted, well organized effort had, however, been made to link such work up with school improvement and local progress. These were merely incidents; since they had products they exhibited, and the agricultural societies gave space and recognized merit.

In the fall of 1914 an exhibition of school garden products was held in District No. 21, parish of Moncton. This was largely attended. The district is small and is classed as "poor." The influence on the school was good and encouraged the teacher and pupils to try again, this time greatly aided by the trustees and ratepayers.

Last fall, though weather conditions throughout the spring and summer had not been so good as in the previous year, a very excellent exhibition was held. The attendance of visitors was much larger. In addition to flower and vegetable exhibits some really good domestic science articles were shown.

These two exhibitions have done much to popularize practical education in that district and vicinity. I do not suppose that in either year this district could be said to have

had a school fair. No prizes of any kind were given. There was no competition. They were merely calls to the people of that and surrounding districts to come to the school to see the work of the pupils, and to hear addresses on community improvement plans through the school.

On Sept. 11th of last year in District No. 4, Coverdale, what may be called the first school fair in New Brunswick was held. It was perhaps in some measure due to what had been done in District No. 21, Moncton. Pupils entered into competition with each other both in school garden and home plot products. Prizes were awarded from funds supplied by ratepayers and friends of people in the district. No money was supplied from our department. The prize list amounted to only \$10.

A committee of three inspected the exhibits and assigned prizes. The afternoon was given up to an examination of school grounds and building, garden, play section of premises, school-room, apparatus, library, children's indoor work, etc.

It was indeed a happy assemblage that at five o'clock sat down to a feast on the school ground.

In the evening in the public hall near by an audience that filled the building enjoyed a carefully prepared programme, in which the pupils largely participated. Competitions and readings were interspersed with singing and addresses by invited guests. As prizes were awarded to successful competitors in garden and home plot work cheer after cheer from the children spoke the pleasure of the young people.

It was really a community progress day. Every feature of school work was magnified by the occasion.

This initial attempt at school fair enterprise is certainly not on a large scale. It is a beginning, however. It is helping to create a sentiment among the people that the school should train pupils to better their condition in the country. It is teaching us all how to conduct school fairs on a larger plan under Departmental

direction and supervision. We have no desire to exploit a movement and thereby give opportunity for truthful adverse criticism. Up to the present New Brunswick did not have the conditions to warrant attempts of this character. With the increase in school gardens, home plots, school clubs and local improvement circles, we believe that this coming fall will see many advance efforts worthy of commendation.

THE TEACHERS' WINTER SHORT COURSE

BY R. P. STEEVES, M.A., DIRECTOR OF ELEMENTARY AGRICULTURE

THE prescribed Nature Study and Agriculture course for the elementary grades of the public schools of New Brunswick has made demands on many teachers that they do not feel competent to meet. Persistent requests have been made by them for a text book on the subject that lessons may be prepared by their pupils. Our educational authorities recognizing that the requirement, at present at least, is not a book, but rather a change of method in teaching, that observation and study of objects is the best avenue of approach to an appreciation of nature, are endeavouring to meet the need accordingly. Teachers who have certificates obtained at rural science schools and who are engaged in districts that have established school gardens possess advantages that assure increasing success. Those who have had no special instruction and training to aid them in experimentally presenting nature as a school subject, but who are required to teach it, as it is prescribed in all schools, feel keenly their disability. To meet in a measure such conditions a plan was suggested to organize a Teachers' Winter Short Course of one week (5 days) to be held in the agricultural school building at Sussex. No definite action was taken

until about the middle of November last. Only teachers who had not attended rural science schools were eligible for admission. The time chosen for the course was the first school week in January (3-8). Facilities for only 100 teachers were available. Doubt was expressed that, owing to the short time given for notice, a sufficient number would apply. A descriptive circular was mailed on November 18th. Before December 1st more than the desired number of applications had been received. Before December 18, the date limiting receipt of applications, over 300 had come in, notwithstanding the fact that public announcement was made through the press that the number limit had been reached. About 50 rural science school students were among those who had to be declined.

The school opened on January 3rd, as planned, with 107 teachers in attendance. The daily sessions were from 8.50 to 12 in the morning and from 1.30 to 4.50 in the afternoon, hour periods with five minutes intermission, and evening sessions, Monday excepted.

The names of instructors, the subjects dealt with and the number of periods allotted to each, were as follows:—

Wm. McIntosh.....	General Nature Study.....	7 periods
R. P. Gorham }.....	Plant Propagation and Soil Fertility.....	10 "
H. B. Durost }		
G. LeLacheur.....	Seeds and Weeds.....	6 "
G. C. Cunningham.....	Plant Diseases.....	2 "
F. A. Dixon.....	Local Geography.....	1 "
R. P. Steeves.....	Instruction Methods.....	2 "

The pupils were arranged in three classes the better to enable them to perform experiments and study from objects the various features of the work. As at rural science schools the principle of "learning by doing" was made use of so far as possible.

Throughout the interest was great and many expressed a desire to have the course extended to two weeks. I believe this experiment of a Teachers' Winter Short Course has proven highly successful and profitable, and that it will enable the teachers who attended to approach nature study in their schools more intelligently.

On the evening of the 4th Dr. W. S. Carter, Chief Superintendent of Education, addressed the students and followed with a round table talk under his direction. On Wednesday evening, Prof. S. B. McCreedy, Prince of Wales College, Charlottetown, was the speaker; on Thursday evening Dr. David Townsend, Superintendent of Riverglade Sanitarium,

gave an illustrated address on sanitation and health, dwelling chiefly on tubercular diseases; on Friday evening Mr. L. S. McLaine, Dominion Representative for New Brunswick in charge of Brown-Tail moth study in this province, gave the last of the series of illustrated addresses.

In addition to the direct advantage to the teachers who attended, this course has publicly drawn attention throughout the province to the value of nature study and to the relation of education to the practical affairs of life. It has shown us that our teachers are willing to avail themselves of opportunities offered to obtain preparation for their high and responsible duties. We believe it will aid in directing the teaching profession to more accurately and thoroughly study provincial resources and industries for educational purposes as well as from the economic standpoint.

In the last named school (Arnaud) all the children are Ruthenians and the district has not yet been one year in operation, nevertheless this is perhaps one of the best, if not the best, school garden in the province, in a rural school. It consists of about half an acre and contains hundreds of ash, maple and willow seedlings. Wild cranberries, garden raspberries, and perennial flowers of various kinds are to be found in it. It has a garden plot for each child and a number of experimental plots of wheat, barley, oats, and alfalfa.—*Inspector M. Hall-Jones, in Report Manitoba Department of Education, 1915.*

PART IV

Special Contributions, Reports of Agricultural Organizations, Notes and Publications

SOCIETIES AND ASSOCIATIONS

CONVENTIONS AND ANNUAL MEETINGS

The New Brunswick Farmers' and Dairymen's Association, Fredericton, N.B.; Secretary, J. B. Daggett, Secretary for Agriculture, Fredericton, N.B.; February 28th to March 2nd.

The Veterinary Association of Manitoba, Industrial Bureau, Winnipeg; Acting secretary, S. Martin, Winnipeg, Manitoba; February 15th, 1916.

The annual meeting of the *Interior Stock Raisers' Association of British Columbia*, will be held at Kamloops on June 6th, 1916.

The British Columbia Stock Breeders' Association, Secretary, W. T. McDonald, Department of Agriculture, Victoria, B.C., March 13th and 14th.

NOVA SCOTIA FRUIT GROWERS' ASSOCIATION

At the annual convention of the Nova Scotia Fruit Growers' Association held recently, resolutions were passed asking for prohibition for the whole province, directing the attention of the Industrial and Economic Commission to the advisability of putting fertilizers on the free list, and of taking steps to increase the production of dog-fish fertilizer; calling the attention of the provincial Secretary for Agriculture to the importance of appointing an inspector of apiaries to give instruction on the suppression of the foul

brood disease, and asking the provincial legislature to pass an act for the suppression of bee disease similar to the acts passed in Quebec and British Columbia.

The officers elected were as follows: President, F. A. Chipman, Nictaux; vice-president, Professor W. S. Blair; executive, S. C. Parker, Berwick; A. Stanley Banks, Waterville; F. H. Johnson, Bridgetown; J. Elliott Smith, Wolfville; secretary, Manning Ells, Port Williams.

NOVA SCOTIA FARMERS' ASSOCIATION

At the twelfth annual convention of the Nova Scotia Farmers' Association held at Windsor on January 25th, 26th and 27th, among the resolutions passed was one asking the railways to make reduced rates on ground limestone, and Professor Cumming was requested to take the matter up with the companies. Another asked for removal of the duties on commercial fertilizers; a third asked the provincial legislature to amend the stallion law so that all grade and unsound stallions should be done away with before January 1st, 1918, and recommending the appointment of an inspector to see that the law as it

exists is enforced; a fourth favoured the taking of steps to secure legislation for the abolition of scrub and grade bulls, a petition for circulation among members of agricultural societies being adopted in accordance therewith.

The following officers were elected: President, R. J. Messenger, Ridgetown; first vice-president, Wm. Murray, Westville; second vice-president, Samuel Freeman, Amherst; directors, H. A. Moffat, Grove's Point; Walter Churchill, Yarmouth; Ronald Chisholm, Antigonish; C. A. Maxwell, Mount Thom; secretary-treasurer, C. R. B. Bryan.

THE NOVA SCOTIA POULTRY ASSOCIATION

The annual meeting of the Nova Scotia Poultry Association was held at the Agricultural College on Friday, January 14th, 1916. Representative delegates of the different poultry clubs throughout the province were in attendance. The usual routine business, revision of the prize list and recommendations for amendment to the Act were passed. The following resolution was discussed and unanimously adopted:—

Resolution No. 1: Whereas (1) Canada formerly exported eggs to Great Britain in large quantities but during recent years very few have been exported;

(2) In view of the European war and the fact that at present Canada will have some eggs to export, it is important to the Canadian farmers that every thing be done to encourage this trade by every assistance possible at this opportune time;

Resolved, That eggs exported from Canada be subject to inspection the same as apple exports are now subject, and that exporters be compelled to grade all eggs exported and that grades be marked on the cases;

That the grading of eggs be the same as adopted by the Canadian Poultry Producers Association at the meeting at Guelph, on January 11th and 12th, 1915, in order that the standard of Canadian eggs be kept as high as possible and maintained at this high standard.

Further resolved, That a copy of this resolution be forwarded from this association to the Honourable Minister of Agriculture for Canada, advising that the proper legislation be enacted at as early a

date as possible to enforce inspection and grading of exports of eggs and thus protect the interests of the Canadian farmer and poultryman.

Whereas, this association is interested in promoting the production of eggs and poultry of superior quality and wishes to place itself on record as pledged to work to this end by supplying only fresh eggs to dealers; and

Whereas, eggs of good quality are supplied to many stores and dealers who by neglect and carelessness place these eggs in store windows under the exposure of the hot sun, thereby destroying the quality of this perishable food product;

Resolved, That this association endeavour to bring to the attention of the dealers of eggs in this province, the necessity of keeping fresh eggs in a cool compartment in the store and using attractive display cards in windows instead of placing eggs in such places that their quality is impaired.

And further resolved, That the secretary be instructed to write a letter to the dealers asking that attention be given to this important matter in future and thus assist the consumers to secure a better quality of eggs and prevent loss from this source.

The officers for 1916 are: President, F. E. Jackson, North Sydney; 1st vice-president, Jas. Bailey, Bridgewater; secretary, J. P. Landry, Truro. Directors: E. E. Prehill, New Glasgow; W. W. Osburne, New Glasgow; Percy Carey, Yarmouth; W. H. Henry, Shubenacadie; D. M. Brodie, Glace Bay; Harold Whidden, Antigonish; Charles Johnson, North Sydney.

NEW BRUNSWICK POULTRY ASSOCIATION

The annual meeting of the New Brunswick Poultry Association was held in Fredericton on Thursday, February 3rd.

The following officers were elected for the year: Hon. President, Hon. J. A. Murray, Minister of Agriculture; Hon.

Vice-president, J. B. Daggett, Secretary for Agriculture, Fredericton; President, J. V. Jackson, Moncton; vice-president, A. D. Thomas, Fredericton; secretary-treasurer, Geo. H. Seaman, Moncton.

ONTARIO CORN GROWERS' ASSOCIATION

The annual show and convention of the Ontario Corn Growers' Association was held at Chatham, Ont., on February 2nd, 3rd and 4th. The rink in which the show was held was well filled with exhibits not only of corn, but with implements used in its cultivation, harvesting and handling. Instructive addresses were delivered by Professor R. A. Moore of Wisconsin; Professor C. A. Zavitz of the Ontario Agricultural College; Fred. Forsythe, District Representative; E. D. Eddy, Chief Seed Analyst, Ottawa; S. J. Moore, also of the Seed Branch, and others. A resolution was passed approving the seed corn control agreement as published in Part 1 of this

number of THE AGRICULTURAL GAZETTE. In his address Professor Zavitz said that in 1915 there were 753,509 acres of corn in Ontario, while 173,934 acres were devoted to potatoes, about the same acreage to root crops and 62,836 acres to beans, making a total of 1,163,858 acres valued at \$35,000,000.

The officers elected were as follows:—Hon. president, Byron Robinson; president, Robert Kinister; first vice-president, Lester Gregory; second vice-president, L. D. Hankinson; secretary, J. W. Noble, B.S.A., District Representative, Essex, Ont.; treasurer, J. H. Coatsworth.

ONTARIO VEGETABLE GROWERS' ASSOCIATION

At the annual meeting of the Ontario Vegetable Growers' Association held in Toronto on January 31st, 1916, the following officers were elected: President, F. F. Reeves, Humber Bay; first vice-president, J. J. Davis, London, Ont.; second vice-

president, E. K. Purdy, Kingston, Ont.; secretary-treasurer, J. Lockie Wilson, Toronto; executive committee, F. F. Reeves, J. Lockie Wilson, J. J. Davis, E. K. Purdy and Thomas Delworth.

THE ONTARIO FRUIT GROWERS' ASSOCIATION

At the annual meeting of the Ontario Fruit Growers' Association held in Toronto, on January 19, 20 and 21, the following officers were elected for 1916:

President, Dr. A. J. Grant, Thedford;

Vice-president, F. J. A. Sheppard, St. Catharines; Secretary-treasurer, J. W. Hodgetts, Department of Agriculture, Toronto.

THE ONTARIO PLOUGHMEN'S ASSOCIATION

The annual meeting of the Ontario Ploughmen's Association was held in Toronto on February 7th, 1916. Owing to the great scarcity of farm labourers, which is threatening to hinder the development of Canadian farms, the following resolution was adopted: "That the executive of the Ontario Ploughmen's Association wait on the Honourable, the Minister of Agriculture for Ontario, and request him to get in touch with recruiting officers in the rural districts and endeavour to arrange, if

possible, that at least one capable farm hand be left on each one-hundred-acre farm in the province so that the campaign for increased production may not fail in 1916."

The 1916 officers are: President, Wm. Doherty, Eglinton; vice-presidents, L. Smith, Millbrook, and N. W. Mallory, Woodbridge; treasurer, T. A. Patterson, Eilesmere; secretary, J. Lockie Wilson, Department of Agriculture, Toronto.

MANITOBA GRAIN GROWERS' CONVENTION

The annual convention of the Manitoba Grain Growers' Association was held at Winnipeg, January 5th, 6th and 7th. A membership of 7,200 was reported, an increase of 1,200 in the past year. The receipts were \$7,636. 7, of which \$5,004.65 was derived from membership dues. Five hundred and ten delegates were present at the convention. A large number of resolutions were passed, among these being resolutions dealing with the question of agricultural credit; the co-operative and economical slaughtering and marketing of live stock and live stock products, and the inspection of grain.

Resolutions were also passed approving the association's course in negotiations with the federal government in the matter of free wheat; asking for a revision of the Provincial Co-operative Act of Manitoba;

calling for the punishment of anybody illegally concerned in war-contract transactions, and urging grain-growers to do everything within their power, individually and collectively, to bring the war to a successful close.

ELECTION OF OFFICERS

The election of officers resulted as follows:—President, R. C. Henders, Culross; 1st vice-president, R. S. Wood, Oakville; 2nd vice-president, Mrs. A. Tooth, Eli; Directors—T. W. Knowles, Provencher; Peter Wright, Lisgar; Andrew Graham, Macdonald; D. S. McLeod, Souris; A. McGregor, Neepawa; F. Simpson, Marquette; R. J. Avison, Dauphin; H. Ford, Nelson; F. H. Wiencke, Selkirk; Robt. Fisher, Springfield; P. D. McArthur, Portage la Prairie.

ALBERTA PROVINCIAL POULTRY ASSOCIATION

At the annual meeting of the Alberta Provincial Poultry Association, held at Lethbridge, December 30th, 1915, the officers elected were as follows:—President, R. B. Hunter, Edmonton; first vice-president, A. E. Humphries, Lethbridge; second vice-president, A. Hatcher, Calgary; executive committee, W. H. Gibson, Calgary; R. E. Moffatt, Claresholm; A. M. Douglas,

Edmonton; P. Ashcroft, Lethbridge; Geo. Stevenson, Camrose; Chas. Moore, Granum; Hiram Perry, Gadsby; F. Ware, Medicine Hat; S. Darroch, Edmonton; secretary-treasurer, W. McC. Moore, Edmonton. It was decided that the next provincial poultry show should be held at Medicine Hat.

THE NATIONAL LIVE STOCK WEEK

From January 31st to February 4th there were held at Toronto, the annual meetings of most of the Record Associations in Canada, the Ontario Live Stock Associations, the United Farmers' Association of Ontario, the Dominion Grange and the Ontario Association of Fairs and Exhibitions.

THE DAIRY INDUSTRY

All the meetings were largely attended, the gatherings being the best ever held in point of attendance and probably in interest. A general feeling of optimism was apparent. The proceedings were mainly confined to presentation of annual reports, discussions thereupon, to material business and the election of officers, except on the evening of the third day, when both the Ayrshire and Holstein-Friesian Associations held their annual dinners, at which a series of instructive addresses were delivered, among others by Dr. C. C. James, Federal Commissioner of Agriculture; Mr. H. A. Craig, Deputy Commissioner of Agriculture for Alberta; Dr. S. F. Tolmie, Representative of the Live Stock Branch, British Columbia; Professor Geo. E. Day, of the Ontario Agricultural College; Professor H. Barton of Macdonald College, and Mr. C. F. Bailey, Assistant Deputy Minister of Agriculture for Ontario. At these dinners special tribute was paid to the dairy industry, regarding which in his address Dr. James said:—

"In Ontario the output was seventy per cent over 1914, and the market value was increased ten to twenty per cent. Alberta and Saskatchewan also made big increases in dairy production; so did other provinces. In 1910, according to the Dominion Dairy Commissioner, the milk products of Canada were worth approximately \$110,000,000. It is a safe estimate to put the dairy output of Canada for 1915 at \$150,000,000. While discussing wheat we should not forget the dairy cow. She has done more for Canada during the past ten years than have our wheat fields, and, in view of what is now happening the world over, there is a possibility that the dairy products of Canada in 1916 may exceed wheat in value. The wheat fields reached their maximum yield per acre in 1915, the dairy cow is only getting into her stride. She is now producing 4,000 lb. or less a year; 10,000 lb. a year is what the dairymen are working for."

THE BEEF BREEDS

Prior to the annual meetings proper the directors of each association met and agreed in several instances upon a series of recommendations and considered the reports that were to be made. The Shorthorn Association among other matters favoured

the appointment of a publicity man, or field officer, whose duty it would be to conduct an active propaganda in the interests of the breed, specially as regards dual Shorthorns, for which it was agreed there was an ever-increasing demand. It was also decided to ask the provincial government to grant special licenses to auctioneers of pure-bred stock. A resolution was approved providing that representation on the boards of the different breed associations should be regulated by the amount of fees paid by each province. The financial report of the association was most satisfactory, showing receipts in 1915 amounting to \$1,140.98 in excess of 1914 and a favourable balance at the end of the year of \$33,541.44. The Herefords, like the Shorthorns, also reported a prosperous year.

THE DAIRY BREEDS

All the dairy breed associations, to which previous reference has been made, reported that 1915 had been a good year and that they found themselves in a position to make grants to exhibitions for competitive tests and for patriotic purposes equal to those of last year. Indeed in some cases increases were made. The keynote of all sections was better breeding and more of it.

THE HORSE ASSOCIATIONS

The spirit of the horse associations seemed to be, while not so optimistic as that of the cattle men, at least decisively hopeful. The Clydesdale association reported receipts for the year of \$10,318.77, a decrease of \$390.78 compared with 1914, but to offset this there had been a reduction of \$994.09 in expenses. The association had assets of \$19,859.90 over liabilities. Shires had an increase in membership fees and had fared well. The Hackney Association reported the most prosperous year in its history, there being an increase in registrations, transfers and membership. A resolution was passed favouring the establishment of a building for the exclusive use of live stock associations. The Canadian Pony Society confirmed the proposition approved at the annual meeting of 1915 that the Hackney Society should take over the Hackney pony section of the stud book. Each association announced a subscription to the Blue Cross fund to be used in the purchase of an ambulance for horses wounded in battle.

SHEEP AND SWINE

The members of the Dominion Sheep Breeders' Association were full of anticipatory prospects. The registration for the past year showed an increase over 1914 of 1,298 and the treasurer announced \$5,771.40 cash on hand. The Ontario

Sheep Breeders' Association also reported a satisfactory year and passed resolutions requesting the executive of the winter fair at Guelph to appoint representatives of the association on the sheep committee, deciding to give two prize cups, one for long woolled breeds and one for short wool, to replace the Drummond cup recently won outright, asking the provincial legislature for legislation to give sheep better protection against dogs and calling upon municipalities to pay at least two-thirds of the value of sheep so killed.

The Dominion Swine Breeders' Association passed resolutions authorizing the executive to correspond with the American Swine Breeders' Association, with a view to the establishment of a reciprocal standard of registration; advocating the removal of grade hogs from the prize lists at fairs, and recommending that a class for butcher stock be provided at the Ottawa Winter Fair. The Ontario Berkshire Association also favoured a reciprocity of registrations with the American Berkshire Society.

The Ontario Horse Breeders' Association recommended the appointment of an inspector, to be approved by the Manitoba government, to pass upon horses going from Ontario to Manitoba.

ELECTION OF OFFICERS

The officers elected by the different associations were as follows:—

CANADIAN CLYDESDALE BREEDERS' ASSOCIATION

President, John A. Boag, Queensville, Ont.; vice-president, William Graham, Claremont, Ont.; provincial vice-presidents: Ontario, Peter Christie, Manchester; British Columbia, Wm. Montgomery, Ladner; Alberta, E. D. Adams, Calgary; Saskatchewan, Alex Mutch, Lumsden; Manitoba, John Graham, M.P.P., Carberry; Quebec, Robert Ness, Howick; New Brunswick, R. A. Snowball, Chatham; Nova Scotia, Stanley A. Logan, Amherst; Prince Edward Island, Theodore Ross, Charlottetown; representatives on National Live Stock Records' Board, J. A. Boag, Wm. Graham, Wm. Smith, Robert Ness, Peter Christie and Fred. Richardson; secretary-treasurer, Mr. J. W. Wheaton, Toronto.

CANADIAN SHIRE HORSE ASSOCIATION

President, C. E. Porter, Appleby, Ont.; vice-president, Amos Agar, Nashville, Ont.; representatives on National Live Stock Records' Board, Jno. Gardhouse and Amos Agar; secretary, G. de W. Green, Toronto.

CANADIAN HACKNEY HORSE SOCIETY

President, Harry Boag, Barrie; vice-president, Robert Graham, Toronto;

secretary, H. M. Robinson, Toronto; directors for provinces: British Columbia, Walter Renfrew, Okanagan Mission; Alberta, Wm. J. Stark, Edmonton; Manitoba, J. Lemon, Winnipeg; Saskatchewan, Wm. Grant, Regina; Quebec, J. E. Caine, Richelieu; New Brunswick, R. A. Snowball, Chatham; Nova Scotia, Dr. C. A. Webster, Yarmouth.

CANADIAN THOROUGHBRED HORSE SOCIETY

President, Col. Wm. Hendrie, Hamilton, Ont.; first vice-president, J. J. Dixon, Toronto; second vice-president, A. E. Dymont, Toronto; representatives on Canadian National Live Stock Records Board, Colonel D. McCrea, Guelph, and T. J. Macabe, Toronto; secretary-treasurer, T. J. Macabe, Toronto.

CANADIAN STANDARD BRED HORSE SOCIETY

Hon. president, O. B. Sheppard, Toronto; president, W. J. Cowan, Cannington, Ont.; vice-president, Geo. S. McCall, St. Thomas, Ont.; representatives on Canadian National Live Stock Records' Board, Robert Graham and T. H. Hassard; secretary-treasurer, John W. Brant, Ottawa, Ont.

CANADIAN PONY SOCIETY

Hon. president, J. Wesley Allison Morrisburg, Ont.; presidents, W. J. Langton, Toronto; vice-president, J. M. Gardhouse, Weston, Ont., and E. Watson, Hudson Heights, Que.; representatives on National Live Stock Records' Board, W. J. Langton and Robt. Graham; secretary-treasurer, G. De W. Green, Toronto.

ONTARIO HORSE BREEDERS' ASSOCIATION

President, Wm. Smith, M.P., Columbus, Ont.; vice-president, John A. Boag, Queensville; secretary-treasurer, R. W. Wade, Parliament Buildings, Toronto.

DOMINION SHORTHORN BREEDERS' ASSOCIATION

President, J. M. Gardhouse, Weston, Ont.; first vice-president, W. A. Dryden, Brooklin, Ont.; second vice-president, J. F. Mitchell, Burlington, Ont.; representatives on the Canadian National Live Stock Records' Board: Harry Smith, Hay, Ont.; Peter White, K. C., Pembroke, Ont.; Robert Miller, Stouffville, Ont.; J. M. Gardhouse, Weston, Ont.; W. A. Dryden, Brooklin, Ont.; J. A. Watt, Elora, Ont.; secretary-treasurer, H. M. Pettit, Freeman, Ont.

CANADIAN HEREFORD BREEDERS' ASSOCIATION

President, L. O. Clifford, Oshawa, Ont.; vice-president, W. H. Hunter, Orangeville, Ont.; vice-presidents of provinces:

Ontario, A. O'Neil, Denfield; Manitoba, J. A. Chapman, Hayfield; Saskatchewan, W. H. Harrison, Montmartre, Alberta; F. Collicutt, Calgary; British Columbia, C. Charlton, Vancouver; Quebec, W. G. Draper, Compton; Nova Scotia, W. O'Brien, Windsor.

AYRSHIRE BREEDERS' ASSOCIATION

Hon. president, John Bright, Ottawa; president, M. St. Marie, Compton, Que.; vice-president, W. W. Ballantyne, Stratford, Ont.; representatives on Canadian National Live Stock Records' Board: W. W. Ballantyne, John McKee and W. F. Stephen, secretary-treasurer, Huntingdon, Que.

CANADIAN HOLSTEIN-FREISIAN ASSOCIATION

President, M. L. Haley, Springford, Ont.; first vice-president, J. W. Richardson, Caledonia, Ont.; second vice-president, Norman Mitchener, Red Deer, Alta.; third vice-president, Neil Sangster, Ormiston, Que.; fourth vice-president, Dr. S. F. Tolmie, Victoria, B. C.; secretary-treasurer, W. A. Clemons, St. George, Ont.

CANADIAN JERSEY CATTLE CLUB

President, F. L. Green, Greenwood, Ont.; first vice-president, D. O. Bull, Brampton, Ont.; second vice-president, H. A. Dolson, Alloo, Ont.; secretary-treasurer, B. A. Bull, Brampton, Ont.; representatives on National Live Stock Records Board, B. A. Bull, Brampton, and R. J. Fleming, Toronto.

CANADIAN GUERNSEY BREEDERS' ASSOCIATION

Hon. president, Hon. Sydney Fisher, Knowlton, Que.; president, D. G. MacKay, Scotsburn Station, N. S.; first vice-president, Hugh A. Dickson, Central Onslow, N. S., second vice-president, James F. Roper, Charlottetown, P. E. I.; representatives on Live Stock Records Board, D. G. McMay, Scotsburn Station, N. S. (president), and Howard W. Corning, Chegoggin, N. S. (secretary-treasurer).

CANADIAN BROWN SWISS ASSOCIATION

President, C. E. Standish, Ayers Cliff, Que.; vice-president, W. A. Jolley, Waterloo, Que.; representatives on National Live Stock Records' Board: Ralph Ballagh and Ralph H. Libby, Stanstead, Que. (secretary-treasurer).

DOMINION CATTLE BREEDERS' ASSOCIATION

General directors: John Gardhouse, Weston, and Professor G. E. Day, Ontario Agricultural College; representatives to

the Fairs: Canadian National, John Gardhouse; London Western, Harry Smith and W. W. Ballantyne; Ottawa Central, J. J. Hodgins and J. M. Gardhouse; Guelph Winter, W. Dryden, John Gardhouse, R. S. Stevenson and W. W. Ballantyne; Ottawa Winter, Peter White, K. C., John Gardhouse, Professor J. H. Grisdale, and W. F. Stephen, Huntingdon Que.; secretary-treasurer, R. W. Wade, Parliament Buildings, Toronto.

DOMINION SHEEP BREEDERS' ASSOCIATION

President, Lieut.-Col. R. McEwen, Byron, Ont.; vice-president, Jas Bryson, Brysonville, Que.; Representatives on Canadian National Live Stock Breeders' Board: J. D. Brien, R. H. Harding and Lieut.-Col. McEwen, London, Ont.; secretary-treasurer, R. W. Wade, Parliament Buildings, Toronto, Ont.

ONTARIO SHEEP BREEDERS' ASSOCIATION

President, J. G. Gibson, Denfield; vice-president, Henry Arkell; directors: Cotswold—T. A. Shore, Glanworth; Lincolns—J. T. Gibson, Denfield; Leicesters—James Douglas, Caledonia; Oxfords—J. E. Cousins, Harriston; Shropshires—J. Lloyd Jones, Burford; Southdowns—J. W. Springstead, Hamilton; Dorsets—Cecil Stobbs, Leamington; Hampshires and Suffolks—Geo. L. Telfer, Paris, and J. Bowman, Guelph; secretary-treasurer, R. W. Wade, Parliament Buildings, Toronto.

DOMINION SWINE BREEDERS' ASSOCIATION

President, J. C. Stuart, Osgoode, Ont.; vice-president, P. J. McEwen, Wyoming, Ont.; representatives on National Live Stock Records' Board: J. D. Brien, D. C. Flatt, J. E. Brethour; secretary-treasurer, R. W. Wade, Parliament Buildings, Toronto.

ONTARIO SWINE BREEDERS' ASSOCIATION

President, Professor G. E. Day, Ontario Agricultural College; vice-president, John Flatt, Hamilton; secretary-treasurer, R. W. Wade, Parliament Buildings, Toronto.

ONTARIO BERKSHIRE BREEDERS' ASSOCIATION

President, H. M. Vanderlip, Cainsville; vice-president, W. W. Brownridge, Georgetown; secretary-treasurer, R. W. Wade, Parliament Buildings, Toronto.

ONTARIO YORKSHIRE BREEDERS' ASSOCIATION

President, J. C. Stuart, Osgoode Station; vice-president, H. S. McDiarmid, Fingal; secretary-treasurer, R. W. Wade, Parliament Buildings, Toronto.

CANADIAN KENNEL CLUB

President, J. G. Kent, Toronto; first vice-president, Jas. W. Bain, K.C. Toronto; second vice-president, W. M. Coats, Vancouver, B. C.; provincial directors: British Columbia, D. M. Campbell, Victoria, and F. L. Wolfenden, Victoria; Saskatchewan, H. F. Morren, Estevan, and B. Welbanks, Quill Lake; Alberta, P. O. E. Clute, Edmonton, and W. S. Saunders, Calgary; Manitoba, T. Kay McKenzie, St. James, and John Milner, Winnipeg; provincial vice-presidents: British Columbia, J. W. Creighton, Victoria; Quebec, T. A. Moore, Montreal; Saskatchewan, Norman MacKenzie, Regina; Alberta, Dr. C. J. Reid, Edmonton; Manitoba, S. E. Taylor, Winnipeg; Maritime Provinces, W. W. Laskey, Fredericton, N. B.; Ontario, A. A. Lees, Hamilton; representatives on Live Stock Records' Board: J. G. Kent, president, and J. W. Bain, K. C., vice-president; secretary-treasurer, George Barron, Toronto.

UNITED FARMERS' ASSOCIATION OF
ONTARIO

President, R. H. Halbert, Melanethon; first vice-president, A. J. Reynolds, Solina;

second vice-president, W. C. Good, Brantford; secretary-treasurer, J. J. Morrison, Arthur.

UNITED FARMERS' CO-OPERATIVE COMPANY,
LIMITED, ONTARIO

President, Anson Groh, Preston; vice-president, A. A. Powers, Orono; secretary-treasurer, J. J. Morrison, Arthur.

ONTARIO FAIRS AND EXHIBITION
ASSOCIATION

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THE DOMINION GRANGE

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CANADIAN NATIONAL LIVE STOCK RECORDS

The following tables give the number of pedigrees and transfers recorded by the Canadian National Live Stock Records' Board of different breeds of cattle, horses, sheep and swine for five years and of dogs for 1915:—

ASSOCIATION	Pedigrees Recorded					Transfers Recorded				
	1911	1912	1913	1914	1915	1911	1912	1913	1914	1915
Shorthorn...	7430	6681	9173	10186	11135	2639	2763	3647	5813	5063
Ayrshire...	2833	3111	3629	3496	3682	1254	1487	1418	1364	1407
Hereford...	1295	1707	1820	2543	2147	340	301	634	869	769
Swine...	7136	6802	11509	14441	9718	732	744	1231	1916	1507
Clydesdale...	3864	4065	3678	2900	2555	2400	2859	3616	2773	2255
Hackney...	138	144	167	101	128	67	120	162	129	142
Shire...	190	190	274	135	93	71	100	149	93	79
Thoroughbred...	276	134	313	194	219	22	37	70	69	59
Sheep...	2856	3981	3934	4826	6019	664	688	645	1372	1376
Aberdeen Angus...	772	946	1010	1541	1255	236	334	652	761	797
Galloway...	38	72	23	91	63	6	24	6	7	22
Jersey...	715	850	1135	1215	1065	336	321	675	732	887
Red Polled...	145	268	459	102	80	22	29	24	37	45
Guernsey...	99	206	87	154	230	17	39	48	35	39
Canadian Cattle...	325	323	341	338	319	115	126	86	117	124
Canadian Horses...	61	383	96	53	85	16	28	24	15	51
Pony...	88	78	329	228	67	8	43	15	25	31
Belgian...	132	142	106	132	76	49	81	92	83	96
Percheron...	1393	1580	1560	962	825	229	313	556	486	493
Suffolk...	100	51	86	31	35	5	6	18	29	13
French Coach...	13	22	6	19	10	....	....	8	5	14
Standard Bred...	302	358	560	361	319	4	17	93	164	157
Brown Swiss...	....	....	....	....	432	....	....	....	....	4
Dogs*	....	....	....	....	877	....	....	....	....	183
Totals.....	30201	32094	40295	44049	41434	9232	10460	13869	16894	15618

*First year the records were nationalized.

MEMBERSHIP OF LIVE STOCK ASSOCIATIONS, 1915

The following table shows the memberships of the different associations represented on the National Live Stock Records' Board in 1915:—

	Ont.	Man.	Sask.	Alta.	B.C.	Que.	N.B.	N.S.	P.E.I.	U.S.	G.B.	Total
Swine Breeders.....	236	72	127	137	21	227	22	6	11	2	.....	861
Sheep Breeders.....	233	26	29	33	10	249	12	13	15	5	.....	625
Shorthorn Breeders.....	1318	317	220	232	12	63	19	44	15	3	.....	2243
Ayrshire Breeders.....	360	35	27	67	21	565	36	51	25	10	.....	1197
Hereford Breeders.....	123	53	54	89	2	3	.....	4	1	9	.....	338
Jersey Cattle.....	175	17	15	16	42	36	17	18	4	1	.....	341
Galloway.....	6	7	3	7	.....	.....	.....	.....	.....	.....	.....	23
Aberdeen Angus.....	110	44	35	55	2	3	.....	.....	3	1	.....	253
Guernsey Breeders.....	3	1	.....	.....	6	7	6	32	2	.....	.....	57
French Canadian Cattle.....	2	2	.....	.....	.....	184	1	.....	.....	3	.....	192
Red Polled.....	.....	12	7	5	8	.....	.....	.....	.....	.....	.....	32
Brown Swiss.....	.....	.....	.....	.....	.....	5	.....	1	.....	.....	.....	6
Clydesdale Horse.....	1423	360	301	161	39	73	7	13	12	9	3	2401
Shire Horse.....	58	16	17	22	3	2	1	.....	1	4	1	125
Hackney.....	120	9	14	19	15	19	3	5	1	7	1	213
French Canadian Horse.....	1	1	.....	.....	.....	196	1	.....	.....	1	.....	200
Percheron.....	76	44	76	84	5	10	3	1	.....	7	.....	306
Belgian Draft.....	4	6	25	14	1	21	.....	.....	.....	1	.....	72
Standard Bred.....	93	17	28	24	11	15	1	3	3	2	.....	97
Thoroughbred.....	87	7	7	27	8	13	.....	.....	.....	1	.....	150
Pony.....	86	7	10	6	3	7	.....	.....	.....	.....	.....	119
Suffolk.....	1	1	4	14	.....	.....	.....	.....	.....	.....	.....	20
French Coach.....	.....	.....	4	8	.....	.....	.....	.....	.....	.....	.....	12
Canadian Kennel Club.....	256	50	19	27	82	58	15	4	.....	18	.....	529
	4771	1104	1022	1047	291	1756	144	195	98	84	5	10512

The annual membership fee to each association is \$2.00 with the following exceptions: Canadian Hackney Horse Society and Canadian Kennel Club, \$3.00; North American Galloway Association, Canadian Guernsey Breeders' Association, French Canadian Cattle Breeders' Association and the French Canadian Horse Breeders' Association, \$1.00

NEW PUBLICATIONS

THE DOMINION DEPARTMENT OF AGRICULTURE

THE FRUIT BRANCH

The Inspection and Sales Act, Part IX, as amended in 1907-8 and 1912-13 (The Fruit Marks Act and Fruit Packages) with explanatory notes. Bulletin No. 40 of the Dairy and Cold Storage Commissioner's series having been exhausted, this bulletin has been issued for general distribution as Fruit Branch Bulletin No. 1. It comprises thirteen pages and is an exact compendium of an act with which every fruit shipper and dealer needs to acquaint himself. The provisions of two orders in council and of an amended act are also given. The bulletin, the same as all other departmental publications referred to in these pages, can be had on application to the Publications Branch, Department of Agriculture, Ottawa.

THE ENTOMOLOGICAL BRANCH

Report of the Dominion Entomologist, C. Gordon Hewitt, D. Sc., F. R. S. C., for the year ending March 31st, 1915. In this report, which has just been published, an account is given of the activities of the Entomological Branch in the matter of controlling insect pests throughout Canada. The Department now maintains nine field laboratories in different parts of the Dominion, at which investigations on various insect pests are carried on. The report, which is suitably and profusely illustrated, gives a record of the work entailed in the administration of The Destructive Insect and Pest Act, which involves the inspection and fumigation of trees and plants entering Canada; of the campaign against the Brown-Tail moth in Eastern Canada particularly; of the importation and establishment of the parasites of this insect and the Gipsy moth; of

investigations on insects affecting cereals and other field crops, including an account of the Army Worm outbreak of 1913; on insects affecting fruit crops, forest and shade trees, as well as on insects affecting domestic animals and man, garden and greenhouse.

The Control of Cutworms in the Prairie Provinces, by E. H. Strickland, M.Sc., Field Officer, Dominion Entomological Laboratory, Lethbridge, Alta., Circular No. 6. The Dominion Entomologist explains in his introductory letter of this 8-page circular that "Owing to the serious outbreak of cutworms in Southern Alberta in 1912, when upwards of 35,000 acres of grain were destroyed in one district, it was decided to investigate the species of cutworms responsible for the damage and the most satisfactory methods of control under western conditions." During the past three seasons Mr. Strickland has made a careful study of the pest and has carried out extensive experiments on its control. It is further explained by Dr. C. Gordon Hewitt, the Dominion Entomologist, that "In order to make the results of Mr. Strickland's work immediately and conveniently accessible to the farmers of the Prairie Provinces it is considered preferable to publish a brief circular setting forth the habits and the main results of the investigations on control measures." The circular is illustrated with figures of the worm and moth and with scenes of devastation and the subsequent result.

THE PROVINCIAL DEPARTMENTS OF AGRICULTURE NOVA SCOTIA

Provincial Crop Report for 1915. This report of twelve pages gives a detail of the condition governing crop production in 1915, a comparison of the yield of each crop as compared with 1914 and with the average, together with statements of total yields of crops and the numbers of live stock in the province. For statement showing the yield and value of the field crops see page 231 of this number of THE AGRICULTURAL GAZETTE.

ONTARIO

Fruit Branch Circular for January, 1916, contains a complete statement of the proposed change in grading apples, said change being the result of discussion led by Mr. D. Johnson, Dominion Fruit Commissioner at the Fruit Growers' Convention, held recently in Toronto. There is also included a list of varieties, some new and some old, of fruit, "that might prove worth while", and a brief review of "The Work in Pomology" conducted at the Vineland Experiment Station.

Potato Growing Contests. In the 36 pages comprising this pamphlet there is not only a full report on the potato growing contests by boys in Carleton and Russell counties in 1915, but also the report for last year of the girl's gardening and canning competition in Carleton county. Portraits of the successful competitors are given as well as a complete report of the public meeting held in the City Hall, Ottawa, on November 27th, 1915, when prizes were presented and addresses delivered by E. D. Eddy, of the Seed Branch, M. B. Davis, Assistant Pomologist at the Central Experimental Farm, W. D. Jackson, B.S.A., District Representative at Carp, Ont., Hon. Sydney Fisher, W. T. Macoun, Dominion Horticulturist, D. Johnson, Fruit Commissioner, Ottawa, and J. E. McRostie, B.S.A., District Representative, Kemptville, Ont.

Report of Commission on Unemployment. Having regard alike to the composition of the Commission and to the subject itself, it was unavoidable that this Report should deal more with urban affairs than with rural matters. There are, however, a variety of recommendations that have especial reference to agriculture and to country life as distinct from city life. While the argument leading to the findings and recommendations is of much interest and well put, it is of course those findings and recommendations that are of the most vital importance. Among these given in this very valuable blue book of 86 pages, are:

That a false sense of security should not blind the business world in times of thriving trade to the fact that widespread unemployment is likely to recur in future.

That the general problem of Proportionate National Development is deserving of greater recognition than it has yet received.

That a Provincial Labour Commission should be appointed, one of the objects of which should be co-operation with rural and urban committees in regard to vocational guidance, extension of the school age, development of local rural interests and the extension of technical trade, agricultural and domestic training.

That there should be an extension of the present system of industrial prison farms to take in vagrants.

That a policy should be adopted of community and assisted settlement, with provincial farms and agricultural training schools at selected points, as a basis of provincial land settlement.

That a system of employment bureau be officially maintained.

That the establishment of agricultural classes in urban centres is worthy of consideration by the proper authorities, so that city children may have the advantages of rural occupation brought to their attention as well as the economic value and pleasure to be derived from the cultivation of small gardens.

That preparation should be made for the employment of discharged soldiers after the war in rural as well as urban occupations.

That practical education be more fully provided for girls in the schools of the province and that their training shall include the study of food values, cooking, health, physical training, instruction in the use of money, thrift, home economics, gardening and the care of children.

MANITOBA

Woodworking Problems, for use in connection with boys and girls' club contests, by S. T. Newton, Superintendent of Extension Service, Manitoba Agricultural College, Winnipeg. Mr. Newton has prepared a text book of 69 pages with numerous plates of models drawn to a scale that is well calculated to fulfil its mission, which is to help boys and girls to carry on the work of various contests in woodworking. In a foreword explaining the object of the work and laying down the conditions of a two-weeks' short course in practical woodwork and cement construction that will be held wherever there are 25 members of a boys' and girls' club desirous of the training, it is stated that projects have been chosen that are useful around the farmhouse and that can be made with the ordinary carpenter's tools found on most farms. Accompanying each problem is a bill of material, dimensions also being given for finished sizes. It is pointed out that pupils who take advantage of the two weeks' course will have an opportunity of learning more in that time than city boys, who only devote two hours a week to such study, can learn in a year. It is also explained that this year it may be necessary, for lack of instructors, to limit the number of short courses to 20, although there are at least 80 boys' and girls' clubs in the province.

SASKATCHEWAN

Killing and Dressing Pork and Curing Pork and Beef on the Farm, by A. M. Shaw, B.S.A., Professor of Animal Husbandry, College of Agriculture, Saskatchewan. Here is a pamphlet of 21 pages, with photographs of the different processes in killing, dressing and curing, that cannot but be helpful to all so engaged. The directions given are exact and explicit in detail and method.

BRITISH COLUMBIA

Western Canada Live Stock Union. In the last December number of THE AGRICULTURAL GAZETTE, on pages 1213-15, is given a summarized report of the annual meeting of the Western Canada Live Stock Union at Victoria, B.C., on October 27th and 28th, 1915. A full report of the proceedings which has just been issued makes an orange-coloured pamphlet of 78 pages. It includes the constitution of the Union.

British Columbia Crop and Live Stock Report. A preliminary statement for the year ending December 31st, 1915, is Agricultural Department Circular No. 10, by A. B. Tweddle, Assistant Statistician. This circular deals with the agricultural production of the province, considering the area sown and the yields per acre, under the following heads: grains, fodders, vegetables, fruits, dairy products, poultry and eggs, live stock and meats.

The Women's Institute Quarterly, Volume 1, Number 2, for January, 1916, published by the Department of Agriculture, may be accurately termed "The Red Cross" number, containing as it does notes and suggestions on Red Cross work, which includes the work of the British Red Cross, the Canadian Red Cross and the International Red Cross Committee, and an article entitled "Patriotic and Red Cross Work undertaken by the Women's Institutes of British Columbia since the commencement of the War." Other articles worthy of note are, "Objects of British Columbia Consumers' League and Duty of Support," "Influences that make for Culture in Home Life," and extracts from reports of the fall lecturers to Women's Institutes on "First Aid and Home Nursing."

"The only true basis on which the independence of our country can rest are agriculture and manufactures. To the promotion of these nothing tends in a higher degree than chemistry."

Thos. B. Smith's annual oration before the Chemical Society of Philadelphia, April 11th, 1798. This society, organized in 1792, was the first *Chemical Society* in the world.

BOOK REVIEWS

Productive Bee-Keeping: modern methods of production and marketing of honey, by Frank C. Pellett, State Apiarist, Iowa; Philadelphia and London, J. B. Lippincott Company; 302 pages, 5½ by 8¼ inches.

Productive Vegetable Growing, by John W. Lloyd, M.S.A. (Cornell University), Professor of Arboriculture in the University of Illinois; Philadelphia and London, J. B. Lippincott Company; 339 pages, 5½ by 8¼ inches.

Both the foregoing belong to the series of Farm Manuals published by the Lippincott Company and edited by Kary C. Davis, Ph.D. (Cornell), Professor of Agriculture, School of Country Life, George Peabody College for Teachers, Nashville, Tennessee. They are both abundantly illustrated, the first named with 134 photographs and the second with 193. Each also is graced with a coloured frontispiece. There are fifteen chapters in the work devoted to Productive Bee-keeping which take the reader and student completely through the methods of the occupation. The first deals with bee-keeping as a fascinating pursuit, the second with the business of bee-keeping and the others

respectively with making a start with bees, arrangement of the apiary, sources of nectar, the occupants of the hive, increase, feeding, production of comb honey, production of extracted honey, wax, a by-product of the apiary, diseases and enemies of bees, wintering, marketing of the honey crop and laws that concern the bee-keeper. The book on Productive Vegetable Growing, which is divided into thirty-three chapters, it is stated in the preface is written from the viewpoint of conditions as they exist in the great central prairie region, known agriculturally as the corn belt, but the principles laid down are applicable in all sections. The author also expresses the hope that while the book is intended primarily for use in colleges and schools, it may prove helpful to the ever-increasing number of persons who desire to supply their tables with vegetables from their own gardens as well as to persons who contemplate the commercial production of vegetables. Each work is very complete and explicit dealing in plain language and exact terms with every phase of the pursuits. A somewhat unique feature of the book on bee-keeping is the section devoted to methods of advertising with quoted examples.

NOTES

The annual convention of the Saskatchewan agricultural societies was held in Saskatoon during the week of January 4th, 1916.

The New Brunswick Department of Agriculture has arranged a short course in agriculture, to be held in the Agricultural School, Woodstock, N.B., from March 20th to April 1st.

In 1901, according to the statistics of the Department of Agriculture, there were in Manitoba 263,168 cattle, 22,960, sheep and 94,680 hogs. The figures for 1915 show 631,005 cattle, 76,577, sheep and 286,433 hogs.

There are now 151 Homemakers' Clubs in the province of Saskatchewan with a lady director and a lady assistant, who travel from January to December visiting these clubs, carrying a message to them from the University and the College of Agriculture.

Eighty-four agricultural societies in Ontario took part in the 1915 standing field crops competitions. Three hundred and eight crops were entered by 6,500 competitors and 65,000 acres were covered by the competition.

The 1915 Crop Report for the province of Nova Scotia gives the following numbers of live stock in Nova Scotia: Horses, 70,395; milch cows, 145,460; other cattle, 162,913; sheep, 226,406; swine, 60,119; poultry, 1,136,763.

In the issue of THE AGRICULTURAL GAZETTE for October, 1915, "Bee-keeping; a Discussion of the Life of the Honeybee and of the Production of Honey," by Everett Franklyn Phillips, Ph.D., was reviewed on page 1017. In that review the following statement "Morley Pettitt estimates that there are 300,000 bee-keepers in Ontario alone," should read "Morley Pettitt estimates that there are 10,000 bee-keepers in Ontario alone, keeping an average of 30 colonies each."

"Noxious weeds robbed Saskatchewan farmers in 1915 of \$25,000,000. The increasing number of weeds drives us to the conclusion that there is only one permanent remedy for this evil and that is, the use of live stock."—*Hon. Mr. Motherwell, Minister of Agriculture.*

The women employees of the Department of Agriculture of Saskatchewan have banded themselves together to do patriotic and Red Cross work. The organization which is known as the "Motherwell Circle" is raising funds and making comforts for the soldiers. Mr. Alexander Duncan of Moffat, Sask., donated to the circle a pure-bred calf which when sold realized one hundred and fifty dollars.

The Russian Ministry of Agriculture announces that two meat fast days weekly must be observed throughout the Empire if ruinous depletion of cattle stocks is to be averted. Since the beginning of the war horned cattle in European Russia, then totalling 40,000,000, have decreased 25 per cent, owing to the abnormal demand arising from military circumstances and also of the civil population. The seizure of Russian territory has been responsible for a loss of at least 2,000,000 cattle.

There are now 113 agricultural societies in the province of Saskatchewan, an increase of five over the previous year. In addition there are about twenty societies in unorganized districts. The number of exhibitions held during 1915 by these societies was 116, as compared with 100 in 1914, 96 in 1913 and 84 in 1912; 61 ploughing matches were held in 1915 as compared with 44 in 1914. There were also held 50 junior exhibitions, 23 standing field crop competitions and 52 seed fairs.

Mr. F. W. Schofield, D.V.Sc., Instructor and Investigator in the Department of Bacteriology of the Ontario Veterinary College, Toronto, has accepted an appointment to take charge of the work in Public Health and Bacteriology in The Severance Medical School of Korea. This school is provided for by the Presbyterian Mission Board, and will in time form part of the University of Korea. Dr. Schofield will complete his work at Toronto, and go to Korea in September next. Through the federal grant provided under THE AGRICULTURAL INSTRUCTION ACT, he published in 1915 "A Preliminary Report on the Investigation into Equine Abortion." No arrangements have been made as yet for the continuation of this work.

With song, speeches and presentation of prizes the closing exercises of the Peel county short courses in domestic science agriculture were held at Streetsville, on February 11th, 1916. W. Bert Roadhouse, provincial Deputy Minister of Agriculture, delivered a short address and presented a gold medal to Elmer Waite for general proficiency. In domestic science there was an enrolment of 75 girls and in agriculture of 30 boys. There was an attendance of 400 friends and relatives of the students at the exercises, at the close of which a collection was taken up for patriotic purposes, the proceeds to be considered as a gift from the junior farmers.

The two greatest necessities of modern life are education and transportation, for civilization travels in the wake of good schools and good roads. Good roads lead in more good directions than the most far-seeing can contemplate. Commerce begins on the country roads and by-ways; they affect school attendance and literacy; they control markets and prices, values of land, the development and contentment of the people, the cost and pleasure of living, and are scarcely secondary to rail transportation in their far-reaching effect. They determine the character and growth of the community, and the necessity for them cannot be overestimated, for a settled country that isn't worth a good road isn't worth living in.—*The Banker-Farmer.*

"What I want to see in this province is that the high schools and collegiates should be adapted to serve the country, now they are adapted to serve the city, and students are going through for some other profession than agriculture. It seems to me that the Department of Agriculture should make the high schools and collegiate institutes of this province adapt themselves to meet the needs of the people on the farm. First, there should be a piece of land in connection with them for the setting of agriculture, next have two good teachers who are prepared to teach agriculture during the winter months, and during the summer to go out among the farmers and do real extension work. Get the teachers interested in agriculture by teaching it in the high schools and collegiates, and then the teachers will be able to give lessons in agriculture to the children in the rural schools. I want to see the high schools, the collegiate institutes, the college of agriculture and the university give the boy an opportunity to get into the profession for which he is best suited to give service to his country."—*W. J. Rutherford, Dean, Saskatchewan College of Agriculture.*

INDEX TO PERIODICAL LITERATURE

- Fibre Flax,**
Frank C. Miles, Scientific Assistant,
Fibre-Plant Investigations, (U.S.
Dept. of Agriculture, Farmers' Bul-
letin 669) *Bulletin of Foreign Agri-
cultural Intelligence*, Ottawa, Decem-
ber, 1915, page 963.
- Jerusalem's Locust Plague,**
John D. Whiting, 25 illustrations and
map, *National Geographic Magazine*,
Washington, D.C., December, 1915.
- Manitoba Live Stock Associations,**
The Grain Growers' Guide, Winnipeg,
January 12, 1916, page 11.
- The Winter Feeding of Steers,**
W. C. McKillican, Supt. Brandon
Experimental Farm, *Farmer's Advo-
cate*, Winnipeg, January 12, 1916,
page 43.
- Science in Farming—How Plants Live,**
V. W. Jackson, Professor of Botany,
Manitoba Agricultural College, *Farm-
er's Advocate*, Winnipeg, January 12,
1916, page 49.
- The Value of Lime in Agriculture,**
Prof. R. Harcourt, *The Farmer's
Advocate*, London, January 13, 1916,
page 46.
- Agricultural Achievements of the Century,**
Thomas Forsyth Hunt, Dean of the
College of Agriculture, University of
California, *The Ohio Farmer*, Cleve-
land, Ohio, January 15, 1916, page 3.
- Avoidable Losses in the Marketing of
Live Stock,**
O. G. Gleason, Supt. Union Stock
Yards, St. Boniface, *The Nor'-West
Farmer*, Winnipeg, January 20, 1916,
page 58.
- Agricultural Co-operation.,**
The Editor, *Farm and Ranch Review*,
Calgary, January 20, 1916, page 36.
- Eighth Annual Convention of Alberta,**
The Farm and Ranch Review, Calgary,
January 20, 1916, page 45.
- Divide Profits on Basis of Services
Rendered,**
F. M. Clement, Director Vineland
Experimental Station, *The Canadian
Countryman*, Toronto, January 22,
1916, page 99.
- For the Women of the South. 50,000
Volunteers to Work for Better Homes,**
William Harper Dean, *The Country
Gentleman*, Philadelphia, January 22,
1916, page 185.
- The Work of Saskatchewan Advisory
Council of Agriculture,**
Prairie Farm and Home, Regina,
January 26, 1916, page 2.
- The Evolution of Agriculture and Agri-
cultural Education,**
C. L. Smith, *Fruit and Produce
Marketer*, Portland, Ore., January 27,
1916, Page 1.
- Paying for Milk at Cheese Factories,**
Geo. H. Barr, Chief of Dairy Division,
Ottawa, *Farm and Dairy and Rural
Home*, Peterboro, January 27, 1916,
page 3.
- The Consolidated School and the Com-
munity,**
Richard Lees, M.A., *Farm and Dairy
and Rural Home*, Peterboro, January
27, 1916, page 5.
- A School that Became a Business Factor,**
Earl J. Trosper, *The Ohio Farmer*,
Cleveland, Ohio, January 29, 1916,
page 1.
- How the Champion Stood the Test of the
Block,**
The Canadian Countryman, Toronto,
January 29, 1916, page 131.
- Managing Investigations in Cereal Crops,**
Prof. G. H. Cutler, Professor of
Cereal Husbandry, University of
Saskatchewan, *The Saskatchewan
Farmer*, Moose Jaw, January, 1916.
- The Saskatchewan Royal Live Stock
Commission,**
W. J. Thompson, *Farmer's Advocate*,
Winnipeg, February 2, 1916, page 155.
- The Farmer's Magazine**, Toronto, Feb-
ruary, 1916.
The Call to Farm Life, by Prof. J. B.
Reynolds, page 15.
Small Tractors on Eastern Farms, by
R. M. Gordon, page 24.
A Live Stock Survey for 1916, by James
E. Poole, page 32.
The Stride of the Junior Farmer, by
Genevieve, page 39.

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CONTENTS

	PAGE
Production and Thrift.....	301

PART I

DOMINION DEPARTMENT OF AGRICULTURE

The Flax Industry.....	302
The Dominion Experimental Farms:—	
The Division of Horticulture:	
Seed Potatoes, by W. T. Macoun.....	303
The Entomological Branch:—	
Arsenate of Lime in Combination with Soluble Sulphur as a Spray Material for the Apple, by G. E. Sanders.....	305
Appointment of Field Officer.....	307
Thomas H. Cunningham.....	308
The Fruit Branch:—	
Export Apple Trade, by F. H. Grindley.....	308
Inspection of Apple Packing.....	309
The Health of Animals Branch, by Dr. F. Torrance.....	309

PART II

PROVINCIAL DEPARTMENTS OF AGRICULTURE

Short Courses:—	
Prince Edward Island, by W. R. Reek.....	310
Nova Scotia, by M. Cumming.....	311
Quebec:	
The First Series, by A. L. Gareau.....	313
The Second Series, by Abbé Noël Pelletier.....	315
Macdonald College, by Dr. F. C. Harrison.....	317
Short Courses in Household Science, by Miss Frederica Campbell.....	318
Manitoba, by Geo. Batho.....	319
Saskatchewan, by S. E. Greenway.....	322
Short Course at Weyburn.....	323
Farm Drainage:—	
Prince Edward Island, by W. R. Reek.....	325
Nova Scotia, by M. Cumming.....	327
New Brunswick, by J. B. Daggett.....	327
Quebec, by J. A. Grenier.....	329
Macdonald College, by G. E. Emberley.....	329
Manitoba, by F. G. Churchill.....	330
Lime as a Fertilizer:—	
Nova Scotia, by John M. Trueman.....	333
Ontario, by R. Harcourt.....	334
Manitoba, by F. G. Churchill.....	335
Saskatchewan, by John Bracken.....	335
Alfalfa Seed Production and Inoculation:—	
Macdonald College, by James Murray.....	336
Manitoba, by T. J. Harrison.....	338
Saskatchewan, by John Bracken.....	339

The Industrial Farm System:—	
Ontario, by S. E. Todd.....	341
Alberta, by T. Dawson.....	344
The Provincial Gaol, by J. H. Rivers.....	345
Nova Scotia:—	
Boys' Turnip Growing Competition, by F. L. Fuller.....	346
Quebec:—	
Grading of Agricultural Products, by Aug. Trudel.....	347
Notes from District Representatives..	349
Manitoba:—	
Farm Labour Supply.....	351
Will Market Wool Co-operatively ..	352
The Home Economics' Societies.....	352
Saskatchewan:—	
A Potato Planter.....	353
Co-operative Marketing and Shipping.....	354

PART III RURAL SCIENCE

School Garden Plans for 1916:—	
Prince Edward Island.....	355
Nova Scotia, by L. A. DeWolfe...	356
Ontario, by J. B. Dandeno.	357
Manitoba, by H. W. Watson.....	357
Saskatchewan, by A. W. Cocks.....	358
British Columbia, by J. W. Gibson..	359
The Consolidation of Rural Schools:—	
New Brunswick.....	362
Manitoba, by H. W. Watson.....	362
Saskatchewan, from Report of A. W. Cocks ..	365
British Columbia.....	366
Progress of Consolidation in the United States..	367

PART IV SPECIAL CONTRIBUTIONS, REPORTS OF AGRICULTURAL ORGANIZATIONS NOTES AND PUBLICATIONS

The Cost of Living.....	368
Rural School Workrooms.....	369
Co-operative Land Purchase in Denmark ..	370
The Best Varieties of Potatoes.....	372
Good Farming and Gardening Competition for Indians ..	373
The County Agent ..	373
A Blue Bird Bazaar.....	374
The Production of Flax Fibre in Ontario..	375
The Laying of Abnormal Eggs.....	375
Societies and Associations.....	376
New Publications.....	385
Notes.....	388
Index to Periodical Literature.....	391

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PRODUCTION AND THRIFT

A year ago there was carried out by the federal Department of Agriculture a campaign of education and inspiration entitled "Patriotism and Production". This movement involved a series of public meetings in each of the nine provinces, the issuing of an AGRICULTURAL WAR-BOOK and a system of newspaper advertising from coast to coast. That campaign was described in the April number of THE AGRICULTURAL GAZETTE, in which facsimiles of the advertisements appeared. A corresponding campaign designated "PRODUCTION AND THRIFT" has been inaugurated by the Departments of Agriculture and Finance, and is now in progress. This includes the publication of a second WAR-BOOK and a programme of advertising covering the press of the country. When speaking of the present situation and the duties of the Canadian people thereto, Sir Thomas White, Minister of Finance, said:

"It is true that war is the first business of Canada, until success crowns our cause. But it is nevertheless true that modern war is made by resources; by money; by developed natural resources; by products; by foodstuffs; as well as by men and by munitions. And while war is our first business, it is the imperative duty, I repeat, of every man in Canada to produce all that he can, to work doubly hard while our soldiers are in the trenches, in order that the resources of the country may not only be conserved but increased for the great struggle that lies before us.

"The people of Canada can preserve their credit and keep the nation strong for the war by increasing production and exercising a reasonable economy.

"'Work harder, save more', is a good motto for war time."

PART I

Dominion Department of Agriculture

INFORMATION SUPPLIED BY OFFICIALS OF THE VARIOUS
BRANCHES REPRESENTED

THE FLAX INDUSTRY

IN the House of Commons on March 1st, the following motion was presented, debated and passed by the Committee of the whole House:

"That, in the opinion of this House, taking into consideration the stability of the flax industry and the market value of the product, more attention might be given to promoting its cultivation in Canada; that the flax and linen industries should, both as to culture and manufacture, receive encouragement from the Government which would enable it to assume the importance the natural resources of our country assure it. And, to this end, encouragement should be given to farmers by such means as the Government, after full investigation, deem best to increase the production of flax throughout the Dominion."

During the course of the debate upon this resolution the Honourable J. D. Hazen, Acting Minister of Agriculture, pointed out that the Department had already undertaken to investigate the flax industry. In August last, the Director of Experimental Farms made a general investigation into the status of the industry and the possibilities of its expansion in Canada.

Mr Hazen read to the Committee sections of a report that had been presented some months ago to the Minister of Agriculture by the Director of Experimental Farms. This report contained the following re-

commendations to which the Minister had agreed:—

- (1) The establishing of a subdivision for fibre research work as a part of the Experimental Farms Branch.
- (2) The exhaustive trying out of varieties of flax and methods of cultivation on our various Experimental Farms in Canada, and, in addition, at, say, three or four points in the present flax growing districts of Ontario, and possibly at two or three points in Quebec where flax is likely to be successful.
- (3) The establishment on the Experimental Farm at Ottawa of a small but complete plant for all the operations in connection with the production of fibre from flax.
- (4) The securing of a properly trained man to take charge of the work.
- (5) The continuation and expansion of the breeding work and selection work with flax now being carried on at the Central Experimental Farm.

In accordance with the first section of the foregoing recommendations, Mr. G. H. Bramhill, B.S.A., District Representative, Ontario Department of Agriculture, for Lambton County, has been appointed Chief of the Flax Division of the Experimental Farms System. His duties for the present will largely be in the field of what is known as the flax-growing sections of the province of Ontario. Mr. Bramhill will commence his duties on the first of May, 1916.

THE DOMINION EXPERIMENTAL FARMS

THE DIVISION OF HORTICULTURE

SEED POTATOES

BY W. T. MACOUN, DOMINION HORTICULTURIST

THE season of 1915 was very unfavourable for potatoes over the greater part of Eastern Canada. Dry weather in early summer was followed by extremely wet weather in the latter part of the growing season and potatoes which withstood the drought were afterwards, in many cases, badly affected by late blight, and the crop was poor in consequence.

early autumn are warm and dry, hence, providing the season of 1916 is favourable, there should be good crops from last year's seed from all parts of the Dominion where the cool moist conditions prevailed. This conclusion is based on experience gained at the Experimental Farm at Ottawa from comparing the results obtained from potatoes grown where the plants were prematurely dried up by



POTATOES GROWN AT THE CENTRAL EXPERIMENTAL FARM, OTTAWA

Those with smaller tops are from Ottawa seed; those with larger tops from Fredericton seed, 1915

The result has been that the price of potatoes is high and good seed scarce. It is, therefore, important that the best seed that can be obtained is used for the crop this year, and that this seed is handled as economically as possible.

Providing seed potatoes available this year are free from disease, which, in many cases, they will probably not be, we should expect that the tubers developed under the moist cool conditions of last summer and autumn would be better for seed than in a season when the late summer and

hot, dry weather with those from places where the plants were not thus affected.

Certain parts of Canada have, usually, a more favourable season for the production of seed of strong vitality than others and such sections have established a reputation for good seed which, as a rule, is upheld by the better crops obtained from such sources. The term "northern grown" has often been applied to seed potatoes from the places both in Canada and the United States where seed of this kind is obtained;

but it should be clearly understood that it is not the distance north, but rather the weather conditions during the growing season, and the vigour and health of the plants and tubers, which, with a good variety in the first place, determines the quality of the seed. Potatoes require comparatively cool weather when the tubers are developing and such conditions are obtained in more places in northern sections than in the south. Occasionally these favoured northern potato regions have unfavourable weather for the development of good seed potatoes and great loss has followed where crops have been grown from them. It is now becoming recognized that it will pay a buyer of seed potatoes well to see or have his agent see the growing crop near the end of

the season and ascertain whether the plants are in a vigorous, healthy condition, or not. If they are not it will be better for him to obtain his seed from somewhere where they are, even though the potatoes have not been grown in those sections which have, usually, the best seed.

RESULTS OF EXPERIMENTS

Following are examples of the differences in yields between potatoes of the same varieties grown from seed developed in other parts of Canada and seed grown at Ottawa, where weather conditions have not been favourable in recent years. In years following favourable seasons at Ottawa the differences in yields would not be so great:

SOURCE OF SEED	Rochester Rose, Yield per Acre		Carman No. 1, Yield per Acre		Vick's Extra Early, Yield per Acre	
	Bush.	Lb.	Bush.	Lb.	Bush.	Lb.
Nappan seed, 1909.	215	36	198		171	36
C. E. F. seed	44		83	36	74	48
Difference in favour of Nappan seed.	171	36	114	24	96	48

NAME OF VARIETY	Indian Head Seed, Yield per Acre, 1910		Ottawa Seed, Yield per Acre, 1910		Difference in favour Indian Head Seed, 1910	
	Bush.	Lb.	Bush.	Lb.	Bush.	Lb.
Empire State.	448	48	107	48	341	
Ashleaf Kidney.	443	18	41	48	401	30
Dalmeny Beauty.	402	36	160	36	242	
Late Puritan	402	36	39	36	363	
Gold Coin	399	18	119	54	280	24
Reeves' Rose.	374		118	48	255	12
Rochester Rose	363		136	24	226	36
Irish Cobbler	332	12	127	36	204	36
Money Maker	319		70	24	248	36
Carman No. 1	289	18	94	36	194	42
Morgan Seedling.	279	24	46	12	233	12
Average	368	30	96	42	271	48

NAME OF VARIETY	Fredericton Seed, 1915, Yield per Acre		Ottawa Seed, 1915, Yield per Acre		Difference in favour Frederic- ton Seed, Yield per Acre	
	Bush.	Lb.	Bush.	Lb.	Bush.	Lb.
Bovee.	154		100		54	
Gold Coin.	266	12	57	12	209	
Irish Cobbler.	314	36	105	36	209	
Green Mountain.	338		123	12	214	48
Carman No. 1.	358	36	22		336	

Some of the best growers of seed potatoes plant their potatoes late so as to obtain immature seed. The tubers of this crop are developed in the cooler weather of late summer and autumn, when conditions are more favourable for the development of seed of strong vitality.

Taking one year with another the best results have been obtained at Ottawa by cutting the potatoes for seed into sets having at least three good eyes and a liberal amount of flesh. Pieces having from two to three eyes will, as a rule, give good results, and, if conditions are very favourable, sets having one eye will yield well. In very favourable seasons, single eyes or buds gouged out with very little flesh have given fair returns. If dry weather sets in after planting the sets with the greatest amount of flesh have the best chance, hence it is safer to use large pieces on this account. If one had very few potatoes and wishes to make the most of them, they may be mixed with moist chopped straw, moss or other material in a warm place for a few days before planting, care being taken not to break off the sprouts. Roots will soon form and the sprouts may then be broken off and planted carefully in well prepared soil, when if the soil remains moist the plants

will develop well. If one has a considerable quantity of potatoes which are sprouting in the cellar and they are not going to be planted by a machine, it is desirable to keep the sprouts from breaking off and plant either the smaller potatoes whole or cut sets with the sprouts attached. Treated in this way they will give better results than if the sprouts were broken off, as they usually are. In order to prevent the sprouts from breaking off it is necessary to spread the potatoes out somewhere in the light, when the sprouts instead of being pale and easily broken off will be green and can be handled without their breaking. Often the seed that is sprouted in this way is put in boxes especially made for the purpose.

Experiments have shown that it is important to plant potatoes as soon as possible after being cut for seed, as freshly cut seed usually gives a much larger crop than that which has been cut for some time.

In conclusion, it is desired to call attention to the importance of having seed potatoes free from disease. Information in regard to the treatment of diseased potatoes before planting will be found in the Experimental Farm publications.

THE ENTOMOLOGICAL BRANCH

ARSENATE OF LIME IN COMBINATION WITH SOLUBLE SULPHUR AS A SPRAY MATERIAL FOR THE APPLE

BY G. E. SANDERS, FIELD OFFICER IN CHARGE DOMINION ENTOMOLOGICAL LABORATORY,
ANNAPOLIS ROYAL, N.S.

DURING the season of 1915, a large number of spray materials and combinations of the same were tested out at the Dominion Entomological Laboratory, Bridgetown, N.S. Among these materials was a sodium sulphur combination containing 56 per cent—sodium polysulphid sold under the trade name of Soluble Sulphur. This

material was quite extensively used as a summer spray on the apple in combination with lead arsenate, with which it almost invariably gave very severe burning of the apple leaves.

When tested in the laboratory the addition of acid or hydrogen arsenate of lead to soluble sulphur resulted in the very rapid formation and precipitation of lead sulphide,

and the consequent formation of sodium arsenate in solution. With the addition of the neutral or triplumbic lead arsenate the formation of lead sulphide and sodium arsenate proceeded much more slowly, the rate diminishing towards the end. With the addition of arsenate of lime no chemical change was apparent; the affinity of calcium for arsenic was so much stronger than the affinity of sodium for arsenic

that there was no apparent chemical change.

As it was known that soluble sulphur used alone as a summer spray seldom resulted in burning, and that burning usually resulted when it was combined with lead arsenate, it was decided to test out the mixture of arsenate of lime and soluble sulphur for its burning effect on apple leaves.

TESTS OF MATERIALS ON SIX-YEAR-OLD WAGNER APPLE TREES IN F. H. JOHNSON'S ORCHARD, BRIDGETOWN, N.S. TWO TREES IN EACH PLOT

MATERIAL	Date of 1st Application	Results	Date of 2nd Application	Results	Results
	June 18	June 25 No burning.	July 10	July 30 No burning.	August 18 No burning.
Soluble sulphur, 1 lb.-40 gals.	"	60 per cent of leaves burned, 20 per cent leaf surface des- troyed.	"	80 per cent of leaves burned, unburned portion clean and good.	80 per cent of leaves burned.
Soluble sulphur, 1 lb.-40 gals.	"	5 per cent of leaves burned at tips.	"	5 per cent of leaves burned at tips or edges only.	Trace of burning only.
Hydrogen lead arse- nate, 2 lb.-40 gals.	"	No burning.	"	10 per cent of leaves slightly burned at tip.	Injury less appa- rent. Only 5 per cent burning show- ing.
Soluble sulphur, 1 lb.-40 gals.	"	No burning.	"	40 per cent of leaves burned, dwarfed, yellow.	60 per cent burned, dwarfed.
Neutral lead arse- nate, 2 lb.-40 gals.	"	No burning.	"	60 per cent of leaves burned, dwarfed, yellowish.	75 per cent of leaves burned, dwarfed, yellowish.
Soluble sulphur, 1 lb.-40 gals.	"	No burning.	"	All fruit russetted, no burning, leaves dwarfed.	All fruit russetted, no burning, leaves dwarfed.
Arsenate of lime, ¾ lb.-40 gals.	"	No burning.	"	All fruit russetted, no burning, leaves dwarfed.	All fruit russetted, no burning, leaves dwarfed.
Lime sulphur, sp. g. 1.008.	"	No burning.	"	Foliage recovering.	Foliage recovering.
Lime sulphur, sp. g. 1.008.	"	No burning.	Eliminated.	80 per cent of leaves burned at tips.	80 per cent of leaves burned at tip.
Hydrogen lead arse- nate, 2 lb.-40 gals.	"	No burning.	"		
Bordeaux, 4-4-40.	"	No burning.	"		
Bordeaux, 4-4-40.	"	No burning.	"		
Hydrogen lead arse- nate, 2 lb.-40 gals.	June 19	95 per cent of leaves burned, 1/3 of leaf surface destroyed.	"		
Soluble sulphur, 2 lb.-40 gals.	"	No burning.	Repeated.		
Hydrogen lead arse- nate, 4 lb.-40 gals.	"	No burning.			
Soluble sulphur, 2 lb.-40 gals.	"	No burning.			
Arsenate of lime, 1½ lb.-40 gals.	"	No burning.			

The results obtained from the application of June 18-19 are by far the most accurate, as an unusually heavy gale on July 8, 9, 10, just before the second application, injured the leaves by opening the tissues at the edges and breaking the midribs, thereby causing excessive injury by the spray applied on July 10.

The season of 1915, on account of the high winds and excessive moisture, gave throughout the Annapolis Valley more burning from lime sul-

phur than ever was obtained before. The leaves, sprayed with lime sulphur and bordeaux, even where not burned, had a dwarfed and pale appearance. With the soluble sulphur, while many leaves were burned on some of the plots, the burning was usually at the tip or edge and was definite as far as it went, the whole tissue being killed. The unburned portions of the leaves sprayed with soluble sulphur were exceptionally dark green and healthy.

In the one orchard where the mixture of soluble sulphur and arsenate of lead was used without burning, namely that of A. S. Banks of Waterville, N.S., the filling station was within 25 yards of the block of orchard used, and the material was put on the trees before the change to lead sulphide and sodium arsenate had gone very far. In another orchard at Kingston, the owner sprayed one-half of his tank of soluble sulphur and arsenate of lead as soon as it was mixed and there was very little burning; a breakdown in the pump caused a delay of 24 hours in getting the remainder of the tank on the trees, and the trees sprayed with the latter portion were practically defoliated.

A frequent mistake made in using soluble sulphur is to allow the can to remain open and the air to come in contact with the sodium sulphide crystals. This contact with oxygen causes the sodium sulphide to change to sodium thiosulphate or photographers' "hypo" which, even though

it is more or less readily soluble in water, is incapable of any further change, and therefore of no value as an insecticide or fungicide. This change in composition is accompanied by a change in colour from the familiar yellowish green to a yellowish gray.

This evidence and the fact that there is a marked difference in the action of neutral or tri-plumbic lead arsenate and hydrogen or acid lead arsenate on soluble sulphur may account for the varied results which have been obtained from the use of this material.

We are not in a position to make any statements as to the value of soluble sulphur as a fungicide, and we publish the foregoing results to show that a mixture of arsenate of lime, $\frac{3}{4}$ lb. to 40 gals., and soluble sulphur, 1 lb. to 40 gals., gave in our tests practically no burning on apple foliage.

NOTE:—Imperial gallons used throughout.

APPOINTMENT OF FIELD OFFICER

Alfred E. Cameron, D.Sc., M.A. (Aberdeen), M.Sc. (Manchester), has been appointed a Field Officer of the Entomological Branch. He will be specially charged with the investigation of the Pear Thrips and other insects in British Columbia.

Dr. Cameron graduated in Zoology in 1909 in the University of Aberdeen with the degree of Master of Arts. After taking the further degree of Bachelor of Science he took up advanced entomological work under Prof. Maxwell Lefroy, Professor of Entomology in the Imperial College of Science, London, and continued his entomological research work as an Honorary Research Fellow in the University of Manchester in 1912, where he took the degree of Master of Science (M.Sc.) He was ap-

pointed by the English Board of Agriculture and Fisheries to a Government Scholarship and continued his investigations in England and in the United States. In 1914, he spent a year conducting practical entomological work and spraying experiments in the Agricultural Experiment Station of New Jersey, under Dr. Headlee, State Entomologist, and returned to England to take up university work in Manchester and the University College of South Wales. He has published a number of entomological memoirs in various scientific journals and received his doctorate in 1915. His thorough scientific and practical training will make him a valuable addition to the Entomological Staff of the Department.

THOMAS H. CUNNINGHAM

We regret to announce the death on February 16th of Mr. Thomas H. Cunningham, Inspector of Fruit Pests for British Columbia, at the age of 78 years. Mr. Cunningham's health had been poor during the last two years, but he continued his duties in spite of advanced years and diminished vigour with a characteristic tenacity.

For many years he had served the Board of Horticulture of British Columbia as its Inspector of Fruit Pests with a zeal rarely equalled. It was natural that in the prosecution of his work of inspecting orchards and nurseries, imported nurs-

ery stock and fruit, he should fail to please everybody, but to the wholehearted enthusiasm with which he carried out this work is due, to no small degree, the comparative freedom of British Columbia orchards from some of our most serious fruit pests. To name two in particular, the Codling Moth and San Jose Scale, which would have been widely distributed by this time, but for the energetic methods he employed. The fruit growers of the province owe much to his industry and his death removes a unique and valued member of the entomological fraternity of Canada.

THE FRUIT BRANCH

EXPORT APPLE TRADE

BY F. H. GRINDLEY, B.S.A., ASSISTANT TO THE COMMISSIONER

AT the present time, owing largely to the fact that cargo space on trans-Atlantic steamers is considerably restricted, fruit shippers have met with some difficulty in the matter of delays in transit.

After arrival at British ports, fruit is frequently left in the ships' hold for periods extending sometimes as long as two weeks. These delays result, of course, in a deterioration of the quality of the fruit and a consequent falling off in the prices received by the shipper.

Quite recently, too, when the matter of limiting the imports of certain commodities was under consideration by the British Government, many classes of fruit (including apples) were listed. For several days this caused quite a panic among English fruit dealers, inasmuch as such a move would very seriously affect about two hundred thousand of these men in that

country. Fortunately apples were later removed from the list, and Canadian shippers now have an open market in England for that fruit, provided that the necessary vessel space can be obtained.

There are, however, so many shipments of more necessary food stuffs, etc., being imported into Great Britain, that apples are sometimes delayed at points of export. Only recently 25 carloads (5,000 barrels) of Ontario apples, consigned to England via Boston on the S.S. *Franklin*, were "held up" at the latter port on account of the vessel being unexpectedly commandeered by the British Government. A very serious situation resulted, inasmuch as there was no other vessel leaving Boston for four weeks, and the local market was already supplied with fruit.

We have been advised by Mr. J. Forsyth Smith, Canadian Government Fruit Trade Commissioner of

Leeds, England, that a similar situation, or one even more pronounced will exist when the next apple shipping season opens, and we feel that Canadian shippers will do well to take any steps which may lead to a more satisfactory consideration of their interests.

It is not possible to predict just what conditions will surround the

Canadian export fruit trade in six months' time, but it seems reasonable to suppose that if the home demand can be increased there should be no difficulty in disposing of an average crop, especially as the quantity of American apples imported into Canada promises to be considerably below normal.

INSTRUCTION IN APPLE PACKING

Mr. A. H. Flack, Chief Fruit Inspector for the Prairie Provinces and Mr. Frank Loveday, Permanent Inspector for the city of Vancouver, are at the present time working in conjunction with the British Columbia Department of Agriculture. Between February 16th and March

18th, they assisted at numerous apple packing schools in the western province.

Packing demonstrations are also being given at various fruit centres in Ontario. This work is being conducted by Mr. P. J. Carey, Dominion Apple Packing Expert.

THE HEALTH OF ANIMALS BRANCH

BY DR. F. TORRANCE, B.A., D.V.S., VETERINARY DIRECTOR GENERAL

IN the August number of Volume 2 of THE AGRICULTURAL GAZETTE reference was made on page 741 to the adoption by the city of Saskatoon of the Federal regulations for the control of bovine tuberculosis in the herds furnishing milk to the city. There has recently been received a letter from Dr. Arthur Wilson, Chief Health Officer of that city who says:

"I am pleased to be able to advise you that the work for tuberculosis among cattle is progressing very favourably. The herds have all been tested twice and those in which reactors have been found, have been tested a second time. All

additions to herds have been tested and the work is well up to date. The city officials and the citizens appreciate this work very much, and, strange to say, even the dairy-men are speaking well of the test."

I have received a copy of the following resolution passed at the first annual meeting of The Silver Black Fox Breeders' Association of Prince Edward Island.

"Resolved that the sincere thanks of The Silver Black Fox Breeders' Association of Prince Edward Island be extended to the Veterinary Director General of Canada, for establishing a quarantine station for foxes in this Province."

PART II

Provincial Departments of Agriculture

SHORT COURSES

PRINCE EDWARD ISLAND

BY W. R. REEK, B.S.A., DIRECTOR OF AGRICULTURAL INSTRUCTION

PREVIOUSLY short courses in agriculture were held in Charlottetown only. These lasted for two weeks and emphasis was placed on live stock and grains.

The courses this winter were of one week's duration and were conducted at points throughout the province. The aim was, first, to serve those at the extremes of the Island, and then to hold others nearer Charlottetown and Summerside at points where the local demand was strongest. Seven have already been held, and one other will be called at Souris.

The members of the Dominion and Provincial Departments of Agriculture co-operated very closely during the winter. The following subjects were discussed:

<i>By:</i>	
Poultry	W. Kerr, B.S.A. Mr. Marcellus.
Horses	W. J. Reid, B.S.A.
Sheep	W. J. Reid, B.S.A.
Dairy Cattle	Andrew MacRae. Rev. E. Walker. W. J. Reid, B.S.A. Leslie Tennant, B.S.A.
Beef	Theodore Ross, B.A.
Swine	} W. R. Reek, B.S.A.
Drainage	
Organization	} Jas. Thompson. W. J. Reid, B.S.A.
Wool	
Cereals	} J. A. Clark, B.S.A.
Tillage	
Drainage	} P. A. Murphy, B.A.
Plant Diseases	
Manures	W. J. Reid, B.S.A.

Soils	Leslie Tennant, B.S.A. J. A. Clark, B.S.A.
Dairy Products	Fraser T. Morrow.
Factory Organization	Harvey Mitchell.

Eighty-three sessions have been held and the average attendance was ninety. In every locality the people did not appear to grasp the idea until the second day of the course; they were familiar with institute meetings, but a series of meetings lasting a week was something new. The increasing attendance in every case was a source of encouragement to the lecturers. Every session was made as practical as possible. The opportunity for men of a community to meet in their own hall and discuss situations peculiar to their locality seemed to appeal very strongly. Local conditions are so variable that one central course could not give satisfaction. The inability of many of the French population to speak English distinctly often prevented them from entering into discussions in Charlottetown, but not so when at their own meeting. The interest was sufficient and the discussions so keenly entered into that in several cases subsequent meetings have been arranged to thoroughly discuss some particular question. Requests were made at all points for courses next winter. Many requests for courses at other places had to be refused.

Community effort, taking form in breeding activities, marketing of farm produce, such as eggs and wool co-operatively, support of farmers' institutes, which are much like farmers' clubs, was strongly emphasized at every point.

During the course at the Consolidated School, a Women's Institute, a Country Club, with a membership fee of two dollars were formed, and fifty-two members were added to the Farmers' Institute. The co-operative creamery movement was advanced by Mr. Mitchell, and an arrangement made whereby one can be started. The Consolidated School had been closed for some years, and the re-opening will, it is hoped, mark the commencement of a new community life and make it possible to use the school as a centre

for all activities. The necessity for co-operative effort is gradually becoming firmly grounded among the farmers and taking form in many ways. Land drainage received a decided impetus during the courses.

Wherever the courses were held, the people became responsible for part of the expenses; they always did a certain amount of hauling, repairing and other work gratis. The balance of the cost was taken from THE AGRICULTURAL INSTRUCTION ACT grant. The expenses of the lecturers were borne by the Departments under which they were working.

Much credit is due the clergy for the hearty support given the courses and in some cases for the lectures delivered.

NOVA SCOTIA

BY M. CUMMING, B.A., B.S.A., SECRETARY FOR AGRICULTURE

OWING to the absence of several members of the staff of the College of Agriculture, Truro, who are now engaged in active service in defence of the Empire, the number of short courses held in Nova Scotia was somewhat reduced. However, four short courses were conducted as follows:

1. A two weeks' short course at the College of Agriculture, Truro, N.S., attendance 205 men, 50 women.

2. Three days' short course at Yarmouth, attendance 200.

3. Four days' short course at Lawrencetown, Annapolis County, attendance 700, with an average attendance at each class of 275.

4. Three days' short course at Antigonish, attendance 225.

So far as the short course at the College was concerned, it was conducted largely along the same lines as in former years. The greatest of interest was taken in the lime-

stone question which was discussed largely from the standpoint of the extensive experiments which are now being carried on at the College. An average increase in the combined first and second cuttings of a little over 1½ tons of clover per acre on limed versus unlimed land on the college farm, points to the possibility of limestone and clover as a means of gradually increasing the fertility of the soils of at least the eastern provinces. The successful use of lime as a means of controlling club root in turnips and cabbages, which are among the most important crops grown in Nova Scotia, added still further to the interest in this subject. Almost every phase of agriculture received some attention at this short course, and it is difficult after singling out the lime question to state which one attracted more attention than another, although it was very evident that all subjects connected with dairying were followed with special interest;

a matter which is not to be wondered at when one considers the large growth of this industry in Nova Scotia during the past semi-decade.

The outstanding features of the short courses which were held in outlying centres is that they were housed in buildings constructed specially for the purpose. The average cost of these buildings has been about \$2,500 or \$3,000, about half of which in every case has been paid by local organizations such as agricultural societies, county farmers' associations, boards of trade, county councils and finally, by private subscriptions. The balance has been paid out of a portion of THE AGRICULTURAL INSTRUCTION ACT grant set aside for short courses. Each of these buildings contains two rooms, one suited for live stock judging and seated to accommodate 300 or more students, and the other fitted for general class room purposes with about one-half the accommodation of the live stock class room. This arrangement makes it possible to give just as satisfactory a course as could be given at the College. While a live stock class is being conducted by one instructor another instructor can be getting the material together for a class in seed judging, or some similar subject in the general class room, and while the general class room is being used, the live stock man can be getting his material together, so that the whole programme is carried on without any waste of time and just as systematically as at the College itself. The short courses held in these buildings have been very largely attended. In 1915, the average attendance at every class held in connection with

five of these local short courses was 147, and in 1916 the average attendance at each class held in connection with the three short courses was about 170.

The college short course was financed as formerly out of the provincial government grant, but the other short courses were financed out of THE AGRICULTURAL INSTRUCTION ACT grant.

That these short courses are of more than passing interest is well exemplified by the attention given them by commercial firms, who have farm implements and utensils to sell. As an example at the Lawrencetown short course a strong feature was the instruction in spraying, and during the course seventeen power spraying outfits were sold.

These short courses were held one in each county, and the opportunity was taken to conduct county poultry shows, county seed fairs, and to hold meetings of various kinds in which county interests were considered. At the Lawrencetown short course a County Poultry Association was organized, and a big effort was made to promote the interests of the Lawrencetown creamery with a view to making it the one big central creamery for the county.

All things considered, despite the curtailment of the programme, the officials of the Nova Scotia Department of Agriculture feel that the 1916 series of short courses must rank among the most successful held in the history of the province.

NOTE:--The agricultural buildings at Antigonish and Lawrencetown were described and illustrated in the March number of THE AGRICULTURAL GAZETTE.

QUEBEC

THE FIRST SERIES

BY A. L. GAREAU, DIRECTOR OF SHORT COURSES

SHORT courses in Quebec, this year were divided into series, the first being conducted along the Grand Trunk and Quebec Central Railroads, and the second, along the lines of the Intercolonial railway.

The short courses inaugurated in January, 1915, in the province of Quebec, have again been very successful this year. These courses, which deal with the various branches of agriculture, last a week; there are three sessions every day, with an average of nine to ten lectures a day. A great many farmers come from a long distance and take the whole course. A fact which indicates the popularity of this new method of agricultural teaching is that the assistance increases and the interest shown is keener from day to day.

The farmers, a little bashful at the beginning of the week, soon get to know the lecturers and teachers, and ask a number of interesting questions. This year, the work of the teachers has been facilitated by a very complete equipment of charts and articles of demonstration. A part of this equipment was supplied by the Central Experimental Farm, Ottawa.

A number of pamphlets and circulars are distributed after each lecture.

At the end of the week, from twenty-five to thirty people, as an average, take the examination. They receive a valuable souvenir in the shape of a certificate.

This year, domestic science courses were added to the agricultural courses; they are given by Mlle. Jeanne Anctil, director of the domestic science school of Montreal. They were well attended and appreciated by the women and girls of the various districts. On Thursday of

every week, Mlle. Anctil held sessions in domestic science. House-keeping and laundry were discussed at the morning session and cooking at the afternoon session. With the help of the range and the necessary implements, Mlle. Anctil gave lessons and practical demonstrations on the preparation of dishes and the utilization of the remains. Leaflets containing various useful and economic recipes were distributed to the ladies.

The names of the professors and subjects treated are as follows:

Mr. Alphonse Désilets, B.S.A., district representative for Quebec-Montmorency and assistant-director of short courses, lectured on the importance of seed selection, botany, cereals, the growing of wheat, barley, oats, buckwheat, peas, etc.; Cyrille Vallaincourt, bee-keeping instructor and secretary of the short courses, breeds of bees, wintering in a cellar, swarming and the honey crop; A. T. Charron, chief chemist of the province of Quebec, soil physics and chemistry, manures and their uses; O. E. Dalaire, director of the dairy school of St.-Hyacinthe, rural economy and agricultural book-keeping; Leo Brown, agricultural instructor and director of demonstration fields, growing of ensilage corn, growing of clover for seed and fodder production, care of meadows and pastures; G. Reynaud, orchardist, orchard, plantation of fruit trees, pruning and general care of the orchard; M. Maurice Talbot, B.S.A., took the place of Mr. Reynaud at Beauceville, during the week starting on 21st of February; R. A. Rousseau, B.S.A., District Representative for Bagot-Drummond, growing field roots, care of the vegetable garden,

canning and preserving; Mr. Rousseau was replaced at Tring Junction, week of 7th of February, by Mr. Abel Raymond, B.S.A., District Representative for Bellechasse-Dorchester, who gave lectures on the same subjects; Raoul Dumaine, poultryman, value of different breeds of hens, lodging and feeding of laying hens, natural and artificial incubation, fattening, slaughtering demonstrations; L. J. A. Dupuis, Jr., director of the sugar school of Ste.-Louise, Islet County, establishment and care of the maple sugar bushes, tapping, equipment, the making of maple sugar and syrup; Louis Bibeau, dairy expert,

on the advantages of drainage.

At Ste-Justine, Dorchester county, Mr. Victor Fortier, assistant Dominion Poultryman, Experimental Farm, Ottawa, spoke on poultry keeping. A. L. Gareau, director of short courses, lectured on the following subjects: preparation of the soil, sanitation of farm buildings, live stock judging for horses, cattle, sheep and pigs, drainage and agricultural co-operation.

The short courses started on the 8th of November, 1915, and were completed on the 18th of March, 1916.

The following places have been visited up to the present date:



THE SHORT COURSE AT SAINT-PASCAL, QUEBEC

care and transportation of milk, duties of the factory owner and duties of the maker; J. B. E. Trudel, chief of cow-testing associations for the Dominion Department of Agriculture in the province of Quebec, gave a lecture each week on the importance and advantages of cow testing; H. Bébard and J. H. Lavoie, forestry engineers, the advantage of having a woodlot on the farm and the re-planting of land which is unfit for cultivation. Narciss Savoie, B.S.A., professor at the School of Agriculture of Ste-Anne de la Pocatière, joined the group of professors at Plessisville, and spoke

	County	Attendance
St-Romuald,	Lévis,	1,570
St-Agapit,	Lotbinière,	2,105
Plessisville,	Mégantic,	4,000
Victoriaville,	Arthabaska,	3,000
Danville,	Richmond,	900
St-Gregoire,	Nicolet	4,125
Bromptonville,	Richmond,	1,905
Weedon,	Wolfe,	3,050
D'Israeli,	Wolfe,	3,135
Tring Junction,	Beauce,	1,905
Courcelles,	Frontenac,	2,320
Beauceville,	Beauce,	3,345
Ste-Justine,	Dorchester	1,500

Requests for short courses were received from the parishes of Ste-Anne de la Pérade, Champlain county; L'Assomption, L'Assomption county; Beauport, Quebec

county; Notre-Dame de Ham, Wolfe county; Ste-Hénédine, Dorchester county, and St. Casimir, Portneuf county.

The courses throughout have been successful, and much credit is due to the parish priests, who kindly consented to announce these short courses from the pulpit, and who strongly urged their parishioners to attend.

At the request of the Yamaska Agricultural Society, a short course lasting three days was held at

St-Guillaume d'Upton on the 28th, 29th and 30th of December, 1915; three sessions were held at Ste-Martine, Châteauguay county, on the 24th of January, 1916. At the latter place the course was asked for by the Hon. M. Mercier, Minister of Colonization and Fisheries, and Monseigneur Allard, parish priest.

At St-Agait, Plessisville and Beauceville, Messrs. Désilets and Vaillancourt organized Women's Clubs, with the authorization of the Minister of Agriculture.

THE SECOND SERIES

BY ABBÉ NOËL PELLETIER, DIRECTOR

SHORT courses are one of the most useful factors in spreading agricultural knowledge. The practical demonstrations given with the special apparatus used by the teachers help to bring out the main parts of the teaching and to impress them upon the minds of the listeners.

eral farmers admitted, at the end of the week that agriculture had been shown to them in an entirely different light. In a few places, particularly at Rimouski, the lectures had to be repeated in order to accommodate a number of farmers who had come in from a considerable distance.



GROUP OF WOMEN STUDENTS AT THE SHORT COURSE IN DOMESTIC SCIENCE, PLEISSISVILLE, QUEBEC

Everywhere those in attendance showed a great interest, to such an extent that they expressed a regret that the week was not longer. Sev-

Fifteen weeks of five days each were spent in making known the best methods of cultivation and live stock improvement. The district

visited stretches from Lévis to Gaspé. Courses were held at the following places:

	County	Attendance
St-Charles,	Bellechasse,	2,195
Montmagny,	Montmagny,	2,425
St-Jean Port Joli,	L'Islet,	1,577
St-Pascal,	Kamouraska,	3,533
St-Alexandre,	Kamouraska,	4,495
Trois-Pistoles,	Témiscouata,	2,049
Isle-Verte,	Témiscouata,	3,221
Notre-Dame du		
Lac,	Témiscouata,	1,604
Rimouski,	Rimouski,	4,445
Matane,	Matane,	1,988
St-Octave de		
Metis,	Matane,	2,651
Amqui,	Matane,	9,600
St-Alexis,	Matane,	4,810
New Richmond,	Bonaventure,	2,345
Bonaventure,	Bonaventure,	2,525
Grand Total,		49,463

The following subjects were treated:

- Drainage.
- Preparation of the soil.
- Study of soils.
- Rotations.
- Farm manures.
- Chemical fertilizers.
- Plant life.
- Meadows.
- Cereals: wheat, barley, oats, rye, buck-wheat.
- Selection of cereals.
- Diseases of cereals.
- Hoed crops: Corn.
- Vegetables: swede turnips, beets.
- Weed control.
- The vegetable garden.
- Vegetables.
- Fruit growing: Purchase and plantation of the trees.
- Care of the orchard.
- Bee-keeping.
- Live stock judging: Horse breeding.
- Sheep breeding.
- Pig breeding.
- Improvement of milch cows.
- Cow-testing.
- Duties of the patrons and of the makers.
- Maple sugar and syrup industry.

Farm buildings.

Rural economy.

Domestic science: Cooking, making and care of clothes.

Lectures were given by the professors of the School of Agriculture of Ste-Anne de la Pocatière and several experts of the Provincial and Dominion Governments: Among those taking part were the following:

Rev. H. Bois; Rev. P. Levasseur; Rev. A. Létourneau; Jos. Pasquet; Geo. Bou-chard; F. N. Savoie; L. Bibeau; J. B. E. Trudel; M. Bélanger; F. Dionne; M. Hamel; Mlle. A. Desroches; Mlle. E. Leblanc; Mlle. D. Ancill.

The Intercolonial Railway had provided a special car for the lecturers and the demonstration material. We are glad of this opportunity to thank the directors of the I.C.R. for the courtesy which they have shown during these courses.

Programmes were distributed to all the farmers of the districts where the short courses were held and also in the neighbouring parishes. Cow-testing associations were established almost everywhere and the maintenance of agricultural clubs, agricultural societies and co-operative associations was everywhere encouraged. Every day lantern slides were shown on the various subjects treated. These slides were keenly appreciated, and they were very useful to the lecturers in helping them to make the farmers clearly understand the lessons taught.

These courses were paid for partly out of the regular appropriations of the Quebec Department of Agriculture and partly out of the grant under THE AGRICULTURAL IN-STRUCTION ACT.

MACDONALD COLLEGE

FROM REPORT SUBMITTED BY DR. F. C. HARRISON, PRINCIPAL

DURING the month of January, 1916, a series of short courses in agriculture and domestic science was held throughout the province of Quebec. In all 52 meetings were held in 19 places in 11 counties. The total attendance was 2,371. The largest attendance at any one meeting was 180 and the smallest 8, the average, however, being 46. Of the 52 meetings, 36 were for men, the total attendance being 1,740 and the average 48, while 16 of the meetings were for women and were attended by 631, giving an average attendance of 39.

The speakers and their subjects were as follows:

LIVE STOCK

Professor H. Barton—Selection and development of young stock; the proper choice of feeds; stable ventilation; silos and silage; farm management.

Mr. A. R. Ness—Selection and development of young stock; the proper choice of feeds; stable ventilation; silos and silage.

Mr. A. A. MacMillan—Flock improvement; the market lamb; sheep management in relation to wool marketing.

FIELD CROPS

Mr. P. A. Boving—Root seed production; hoed crops with special reference to corn and roots (illustrated); root growing and the feeding value of roots; soil fertility; alfalfas and clovers (illustrated); some essentials in soil management; Canadian seed in Canadian soil.

Mr. R. Summerby—Alfalfas and clovers (illustrated); clovers and grasses; clover growing and seed production; grain growing in Quebec; some essentials in soil management; hoed crops with special reference to corn and roots (illustrated); corn (illustrated).

POULTRY

Mr. M. A. Jull—Farm poultry keeping; winter egg production; hatching and rearing chickens; poultry house construction.

Mr. S. A. Bergey—Winter egg production; hatching and rearing chickens; poultry house construction (illustrated).

HORTICULTURE

Professor Bunting—The apple orchard and small fruit garden.

FARM ENGINEERING

Mr. G. E. Emberley—Underdrainage; silo construction.

The meetings were not up to the usual in attendance. Owing to the scarcity of labour, due to the war, many farmers had to stay at home who would otherwise have attended. The weather also was severe, which with bad roads, interfered with the attendance. At Scotstown only one meeting was held on January 3rd, as, on that day and the day before, a heavy snow storm prevailed making it impossible for farmers from even a short distance to attend. The interest generally was very good; the lectures seemed to be greatly appreciated by those attending and were followed by questions and discussions. In poultry raising interest is developing rapidly throughout the country. Farmers are beginning to appreciate the value of the farm flock well kept, and are interesting themselves in housing, feeding for egg and meat production, breeding, incubating and rearing. The Farm Home meetings for women aroused keen interest and many questions were asked and discussions held.

All of the above meetings were conducted in districts where Macdonald College Demonstrators were resident and employed. These demonstrators were responsible for the local organization of the meetings, advertising, securing of halls, lighting, etc., and for the meeting and comfort of the speakers. They also were able to advise as to the particular subjects suitable for discussion in each locality.

The above course was financed by means of the grant under THE AGRICULTURAL INSTRUCTION ACT.

HORTICULTURE

A short course in horticulture was held at Macdonald College from February 7 to 11, inclusive, under the direction of Mr. T. G. Bunting, B.S.A., Professor of Horticulture, assisted by Mr. A. H. MacLennan, B.S.A., Lecturer in Horticulture, Mr. A. C. Gorham, B.S.A., and Mr. A. H. Walker of the horticultural staff and Mr. F. E. Buck, B.S.A., Assistant to the Dominion Horticulturist. The programme included discussions on all subjects relating to the orchard and garden. Twenty-three students, 13 men and 10 women, were in regular attendance.

POULTRY

A short course in poultry was held from February 14th to March 3rd, inclusive, under the direction of Mr. M. A. Jull, B.S.A., Manager and Lecturer, Poultry Department, assisted by Mr. S. A. Bergey, B.S.A., and Mr. A. G. Taylor, B.S.A., of the Poultry Department, Dr. T. P. Shaw, McGill University, Montreal, the professors of Biology, Cereal Husbandry, Horticulture, and the college veterinarian. The programme included discussions on practically every phase of the poultry industry and demonstrations in killing and plucking. Twenty-six students, 15 men and 11 women, were in attendance.

SHORT COURSES IN HOUSEHOLD SCIENCE

BY MISS FREDERICA CAMPBELL, DEMONSTRATOR FOR WOMEN'S CLUBS

THE following is a report of the third annual series of short courses, conducted by the School of Household Science, at various centres in Quebec from January 4th to 16th, 1916:

NAME OF PLACE	Number of Meetings	Attendance		Average Attendance
		Afternoon	Evening	
Cookshire.....	2	53	76	64.5
Lennoxville.....	2	75	30	52.5
Kingsbury.....	2	36	50	43.0
Ulverton.....	2	20	25	22.5
Dundee.....	2	22	30	26.0
Hemmingford.....	2	25	35	30.0
Bedford.....	2	56	30	43.0
Ayer's Cliff.....	2	30	38	34.0
Total average.....	16			315.5 39

The lectures and demonstrations given this year were as follows:—

DATE	Place	Speaker	Subject
January 4.....	Cookshire	Mrs. Rutter Miss Philp	Food values; planning the daily meals. (Illustrated). The Homemakers' Club and the Rural School.
January 7.....	Kingsbury	Miss Campbell Miss Zollman	The Homemakers' Club and its place in the rural community. Practical Hints on Home Sewing—Demonstration.

DATE	Place	Speaker	Subject
January 8.....	Ulverton	Miss Campbell	The Homemakers' Club and its place in the rural community.
		Miss Zollman	Practical Hints on Home Sewing—Demonstration.
January 10.....	Dundee	Miss Campbell	The Homemakers' Club and its place in the rural community.
		Miss Hill	The Buying of Textiles—Cotton, Linen, Wool and Silk. Illustrated.
January 11.. . . .	Hemmingford	Miss Campbell	Foods.
		Miss Hill	The Buying of Textiles—Cotton, Linen, Wool and Silk. Illustrated.
January 12.....	Lennoxville	Mrs. Rutter	The Feeding of Children.
		Miss Zollman	Cutting and Fitting—Demonstration Lecture in Dress-making.
January 13.....	Ayer's Cliff	Miss Hill	A convenient Kitchen; its plan and equipment.
		Mr. Emberley	Treatment of Walls. (Illustrated.)
January 13.. . . .	Bedford	Miss Campbell	Demonstration—Cake Making.
		Miss Philp	The Homemakers' Club and the Rural School.

Considering, in some cases, the extremely cold weather and, in others, the bad state of the roads, the average attendance, although falling a fraction behind that of last year, may be considered very

good. Those present evinced a keen interest and appreciation of the lectures and demonstrations. Branches of the Quebec Homemakers' clubs were formed at Kingsbury, Ulverton and Dundee.

MANITOBA

BY GEORGE BATHO, EDITOR OF AGRICULTURAL PUBLICATIONS

IN two very important respects the short courses given in Manitoba this winter have been hampered; yet, despite that fact, it is safe to say that never before has this form of education proven itself to be so popular. The two deterring factors to which I allude have been the acuteness of the male farm labour situation, and the severity of the weather during all the mid-winter period.

The most outstanding fact that has characterized the courses this season has been the very much greater attendance at those designed for women than at those planned for

men, and the consequently general feeling that the women's courses have been the better half of the work.

During late fall and early winter, on account of the backwardness of threshing and all other outside work, it was not deemed practicable to offer any short courses for men; but during all this period a succession of one-week short courses in home economics was provided for the women at numerous centres in the province. So active has been the demand for these that sixty such courses have been held during the six months ending March 1st. The instruction in each of these one-

week courses is confined to one branch, and approximately the division has been as follows: Dress-making, 35 schools; millinery, 10; cookery, 10; home nursing, 5. The total enrolment at the sixty courses was 2,100, with an average enrolment of 35.

In addition to the above series of courses, many one-day demonstrations in cookery have been given at scattered points, both in the older and newer settlements, and in connection with these approximately one dozen new home economics' societies have been organized.

The first of this season's short courses for men was held at Killarney

taught in the high school course in one year.

The most ambitious effort of the winter, however, has been a series of five short courses given at Morden, Boissevain, Virden, Neepawa and Dauphin.

The courses at the first four points all began on January 10th, and concluded February 5th, a period of four weeks. The course at Dauphin was of three weeks' duration, from February 21st to March 10th.

This is the first time that short courses of this length have been undertaken at country points in Manitoba, and it was felt that the matter was somewhat in the nature



MEN AND WOMEN STUDENTS AT THE SHORT COURSE IN AGRICULTURE AND HOME ECONOMICS HELD AT BOISSEVAIN, MANITOBA, JANUARY, 1916

during the Christmas holidays, when one week's instruction was presented in mechanical drawing, farm wood-working and forging. There seems to be an ever-increasing demand for illustrations in connection with articles published in our farm papers, and this, together with the general importance of the subject, created a good deal of interest in the draughtsman phases of the work undertaken. Some twenty students attended, and a correspondence course in drawing was organized and has since been carried on by the engineering staff of the Manitoba Agricultural College. The students have now covered as much ground in drawing as is

of an experiment. It was at this point that the pinch of the labour supply and the rigour of the weather were felt. In every case the District Representative or other agent in charge of the course found that there were scores of young men who were anxious to enroll themselves as students, but the pressure of work caused by the enlistment of other members of the family prevented their attendance. This made it very much easier to enroll young women than young men, and the figures indicating the attendance show the result.

At Morden there was a class of men only. Half the time was given to

gas engineering, and the other half to general agriculture. The average attendance was over 70 with a total enrolment of 130. At Boissevain, Virden and Neepawa there were separate classes for men and women, and the enrolment was as follows: Boissevain, 35 men, 70 women; Virden, 30 men, 75 women; Neepawa, 30 men, 125 women.

The instructors in the women's courses were all regular members of the Extension Service of the Manitoba Agricultural College, the present regular extension staff of such women instructors numbering eight. These women are all specialists, mostly chosen because of former vocational experience in the line of work in which they are now teaching. The instructors in the men's courses were of a more mixed complexion, but were mostly well known and experienced farmers, being, in a number of cases, former students of agricultural colleges. A total of 17 men actually took part in the teaching.

Before the courses began a timetable for the whole series was arranged, and by each demonstrator travelling from one place to the other in the same direction, an easy succession at each point was preserved. In each case a District Representative or other permanent representative of the Extension Service remained on the ground and supervised the entire course, giving to the teaching such intimate local interpretation as he considered fitting.

At the time of writing the course at Dauphin is yet in progress, but there are 50 men and 70 women attending. To still further meet the demand in the northern part of

the province, it was found necessary to put on a one-week course at Roblin, commencing March 13th. The men here specialized in gas engineering, and there was a very large enrolment. In fact, it has been noticeable that this winter there is an almost abnormal demand for gas engine instruction.

At the city of Winnipeg, a general course in agriculture, a home economics' course and a course in poultry-keeping were presented at the Manitoba Agricultural College. At these the total enrolment was around 50. Besides these courses night classes in agriculture were held in some of the city schools at which considerable teaching was done by members of the Agricultural College staff. At one school about 80 men have taken the course, and these have been very regular in their attendance.

Behind the individual short courses were the agricultural societies and home economics' societies in the centres visited. These have assisted in securing meeting places and have arranged strong social features. Not only were students enabled to find board and room accommodation at a reasonable rate in private homes, but in most cases a series of evening entertainments by churches and other local organizations was afforded. The courses were arranged by the Extension Service of the Manitoba Agricultural College and the financial outlay was met by the Department of Agriculture. The courses at the Agricultural College became part of the regular work of the College staff, while the night classes in Winnipeg were presented under the auspices of the city school board.

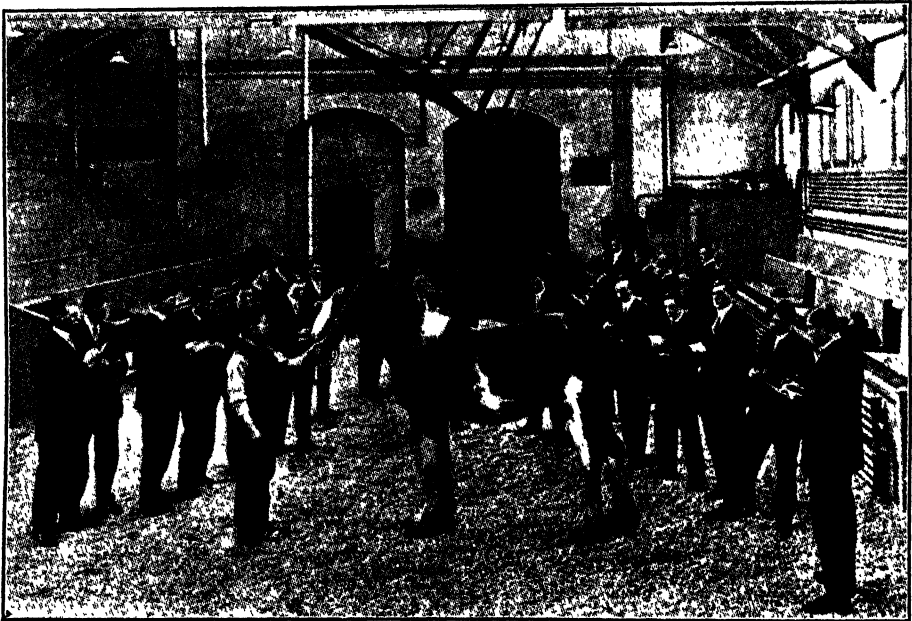
SASKATCHEWAN

BY S. E. GREENWAY, DIRECTOR EXTENSION DEPARTMENT, COLLEGE OF AGRICULTURE

SHORT courses in agriculture conducted by the Extension department of the College of Agriculture, University of Saskatchewan, usually fall between January 1 and March 31. Frequently courses in agriculture are provided in the months of November and December. In the fall of 1915, however, the threshing operations were carried on owing to the bountifulness of the crop, well into the end of the year, thereby

invariable rule that wherever a short course is held a request comes for its repetition each succeeding year. The extension department received 14 requests for courses this year which could not be met owing to lack of staff and equipment.

The experience of the last four years predicates the general rule that four days to a week is the ideal length of short course period under our conditions. The aggregate at-



A SHORT COURSE CLASS IN HORSE JUDGING, UNIVERSITY OF SASKATCHEWAN, SASKATOON

preventing the customary educational activities.

During the first three months of this year there were held 34 courses in agriculture, 11 of which were of one week's duration. The remainder were usually of three days' duration, allowing for two courses in a week. Nine of these courses were conducted at points where courses had been previously given. It is the

tendance at courses of this duration is usually well over 1,500, quite frequently approximating 2,000, allowing for three sessions a day, or an average of over a hundred to the session. This year there has been no diminution in the enthusiasm, although the great numbers who have left for active army service, and the very severe atmospheric conditions and impassibility of the

roads reduced the attendance in many cases.

At all the short courses the subjects of field and animal husbandry were covered in a general way. The field husbandry topics discussed at all the courses were: seed germination and plant growth; the choice and management of farm crops; the cause of low yields; the climate and its relation to Saskatchewan agriculture; our investigation work in crop production, and tillage in relation to crop production.

Animal husbandry was presented in the following subjects: A weak point in our cattle industry; essentials in the production of thrifty profitable livestock; horses—mechanism and classification; practical problems in raising swine; sheep—two crops a year; dairying in its various phases; co-operative live stock breeding and marketing.

At the longer courses additional speakers were provided and instruction given in such subjects as the following: Planning the farmstead; trees and shelter belts; the fruit garden and ornamental plantation; sanitation and hygiene; un-

soundnesses in horses; and common animal diseases and their prevention.

In each case the local agricultural society assumed the responsibility of arranging the short course and giving it publicity in their localities. In a number of cases the Boards of Trade, the School Boards and units of the Grain Growers' Associations assisted in the matter. The Extension department in all cases supplied attractive posters, and the necessary teaching staff free of cost, to the communities which in turn stood the expense of supplying the halls and assuming any other local expense in connection with the courses.

Up to the present short courses in domestic science have been held in conjunction with the courses in agriculture. It was not possible to extend this facility this year in all cases owing to the great increase in the demands for practical work in agriculture. Wherever held the domestic science courses are conducted for the Homemakers' Clubs which assist in giving the work publicity through their regular channels.

SHORT COURSE AT WEYBURN

FROM REPORT SUBMITTED BY MR. A. KENNEDY, M.A., INSPECTOR OF SCHOOLS, WEYBURN INSPECTORATE

THE total attendance at the short course held on February 14, 15 and 16 at the Weyburn Collegiate Institute numbered 1,846, including 429 of the general public, 1,118 school pupils and 299 normal school students. The average attendance at each session was 132.

At the close of the week, Inspector Kennedy was instructed to send the following telegram to S. E. Greenway, Director, Extension Department, College of Agriculture, Saskatoon: "Short Course in Agriculture a success. Thanks for excellent men". In reply the Inspector received a communication assuring

the officials of the Agricultural Society, the Board of Trade, the School Boards and everybody else interested, of the gratitude of the Extension Department for their efforts in making the course a success.

A feature of the course was the interest manifested by the Grade Eight pupils of the Public Schools, the students of the Collegiate Institute and the Third Class Session of the Normal School, Weyburn; also by the Trustees, teachers and senior pupils of South Weyburn, S.D. 670, and Prospect S.D. 560 (both rural). As future citizens these young people are to be commended for their faithful attendance

and close attention to problems so vitally affecting the welfare of the rural communities.

Jas. Naylor of the College of Agriculture, contributed an excellent series of addresses on Field Husbandry. J. McCallum, Shakespeare, Ontario, contributed an interesting series of lectures on Animal Husbandry, including one on "The Raising and Feeding of Swine", for the benefit of those who are looking forward to entering the competition. He offered a gold medal to the winner, if a girl, of this competition. Dr. Hopkins assisted Mr. McCallum in continuing the series. Miss Fannie A. Twiss, Directress of Household Science, and Mr. A. W. Cocks, Director of School Agriculture, each contributed four addresses that will have far-reaching effects on the improvement of conditions in rural schools.

Mrs. Thos. Henderson, President of the Home-makers' Club, Creelman, gave two interesting addresses of particular concern to the women of the rural districts.

The Community Centre Idea was well handled by Mr. S. R. Carrothers, Creelman, and Mr. E. Vandendreissche.

The generous contributions to the evening programme by the musical talent of the City were much appreciated.

The unanimous opinion is that the short course is permanently established in Weyburn and community.

The board of South Weyburn S.D. 670 has provided equipment for the undertaking of household science and manual training, and is affording Miss Bennett, the instructress, every encouragement and support in the fuller education of the children of the district. A warm noon-day lunch is served to the children under conditions that prevail in the home.

On Wednesday, February 16, a number of the trustees and rate-payers and parents accompanied Miss Bennett and the pupils in attending the sessions of the short course. They were enabled to meet with Miss Twiss to discuss various lines of school activities.

At a meeting of teachers held in Assiniboia School, Weyburn, February 19, a Rural Education Association was formed with Hon. Walter Scott honorary-president, C. J. MacKay, principal Souris School, president, Miss E. Bennett, South Weyburn, vice-president, and E. W. Jervis, principal Assiniboia School, secretary-treasurer. A school exhibition is to be held at Weyburn in September. Steps are being taken for the organization of other associations in different parts of the province.

It is proposed to use the parks and golf courses of England, both public and private, for grazing stock and to put land previously used for pasture as far as possible under seed. Many private owned parks are being used for agricultural purposes. In short, everything is being done to increase production.

FARM DRAINAGE

PRINCE EDWARD ISLAND

BY W. R. REEK, B.S.A., DIRECTOR OF AGRICULTURAL INSTRUCTION

THREE very wet seasons have forced the question of land drainage upon the people. In the western part a great deal of the land is level. Part is of a heavy clayey formation, but the remainder might be called a sandy loam, with a hard pan bottom which prevents any drainage whatever. In the counties of Queen's and King's, much is required, but not in large systems; swamps, low parts of farms and springy hillsides will account for most of it. In no section will there be any large expensive outlets, because the Island is narrow at its widest part and arms of the sea extend far inland; there is a large number of creeks everywhere. Probably blind wells will take care of much in some districts.

Tile has never been manufactured on the Island. A few have been installed, but were imported from Nova Scotia and when landed in Charlottetown, 3-inch tile cost from \$28 to \$30 per thousand. The initial cost was so great, and when coupled with the fact that practically no one had any experience in their installation, the question became very difficult.

Some advocated that a ditching machine should be purchased, as an impetus and several other suggestions were rife, but they were of no avail. The remedy was in the placing of the tile before the farmers at a reasonable cost. This necessitated their manufacture on the Island.

Cement tile was carefully considered, but the difficulties of securing sand at advantageous points were too great. Searches were made for clay deposits; brick was being

made in small quantities in some parts and had been made in others, but abandoned. Geological surveys had revealed large deposits of excellent clay. The largest was at Egmont Bay. This site was not satisfactory owing to shipping facilities. It was necessary to secure a site along the railroad, and at the same time be of very easy access to a large number of farmers. The writer, in company with J. A. Clark, Superintendent of the Charlottetown Experimental Farm, and W. J. Reid, District Representative for Prince County, spent a great deal of time prospecting, and finally decided upon a deposit near Richmond. An option was secured and test pits were sunk. A sample of the clay was forwarded to the Mines' Branch, Ottawa. Extracts from the analysis report are as follows:

"This clay should make an exceptionally fine field drain tile, in fact it is the best surface clay in Canada for that purpose in as far as they have been tested by this Department."

"This clay may be suitable for the manufacture of roofing tile, but further tests would have to be made in order to determine other uses for it. It seems, however, to be an admirable clay upon which to found a small industry for the manufacture of red earthenware for sale as art pottery."

In the same field is a large sand-bank, which upon testing proved to be a sandy clay suitable for mixing with the pure clay for tile and brick manufacture.

The field is situated along the railroad, and has excellent drainage, also a spring from which to secure water, and is nearly surrounded with large woods where firewood can be drawn from for some time.

Early in March the organization of a company to manufacture tile was completed. The factory, which will be located at Richmond, will be erected and put in operation early in the present season and will be turning out tile during the coming summer. Brick as well as tile will be manufactured. Arrangements have been made whereby the provincial Department of Agriculture will regulate the prices the farmers will pay for tile.

A DRAINAGE DEMONSTRATION

In October, a field for a drainage demonstration was secured near Wellington, and four acres under-drained. The labour of installing cost \$39.60, whereas the 3000-3-inch tile including freight from Charlottetown cost \$131.32. It can readily be seen why the P.E.I. farmer had not drained. The tile gave such excellent satisfaction during the wet weather in November that many who were very doubtful as to its efficiency are now anxious to secure tile and make a start.

The success of the demonstration field aided much in the securing of capital to start a factory. Everybody is looking forward to next summer, when the plant will be in operation unless something unforeseen occurs.

There are about 2,000,000 brick, used annually on the Island and the greater part are imported. There is sufficient clay throughout the Island to supply Eastern Canada.

Many farmers are in need of ready capital with which to buy tile; many have come through trying times and were just getting into

reasonable condition when the wet seasons came. There are sufficient farmers able and ready to buy more tile than one plant can make with two kilns running steadily for the next two summers. Many will be able to start by draining three to four acres per year. The result is bound to be large numbers of small jobs and conditions will be created under which it will be difficult to operate a ditching machine successfully.

Surveying and assistance in laying the tile, fixing outlets etc., will be given to every farmer at the commencement until a number of men are competent to take the oversight of the work.

During the short courses, information about drainage was given out, but this was so meagre when many have never seen tile laid that it will be necessary to follow the work to every field where the tile is to be installed.

At present there are no open ditches, except the creeks which would serve as outlets. In many cases such will have to be constructed and are necessary under existing conditions to carry surface water.

The province is fortunate in not having a drainage law. The experience of others can be drawn upon, and, no doubt, many mistakes avoided. It is altogether likely that one will be framed and presented at the coming session of the Legislature.

The first important work is to get the plant built and running and then great care must be exercised in the laying, that none may be disappointed.

NOVA SCOTIA

BY M. CUMMING, B.A., B.S.A., SECRETARY FOR AGRICULTURE

I am not in a position at the present time to announce our policy in regard to "Demonstration in Soil Drainage" for the year 1916, the reason being that Mr. B. H. Landels, B.S.A., who was in charge of this work, is already at the front and his assistant, A. E. Humphrey, has enlisted. We have not yet made appointments to the positions which these men have vacated. I may say, however, that we will be in a position to conduct drainage surveys. We also have a power cement tile-making machine which we

will send to certain communities, which are far removed from tile-making factories, in which communities the farmers agree to make not less than 20,000 tile. We have not yet definitely decided whether we will operate the Government traction ditching machine or not, although we are prepared to do so should there seem to be a large demand for it. In the meantime matters pertaining to the war are so absorbing the attention of our people that I hesitate to announce what our complete policy will be.

NEW BRUNSWICK

BY J. B. DAGGETT, SECRETARY FOR AGRICULTURE

IN 1913, the New Brunswick Department of Agriculture purchased a traction ditcher, at a cost of three thousand dollars. It has been in operation for three seasons, not as a commercial proposition, but for demonstration work, as per regulations, a copy of which is appended herewith. Very satisfactory reports have been received by the Department of the fields already drained.

During the summer of 1916 it is the intention of the Department to operate the machine along the same lines as in the past. The Department supplies two men to operate the ditcher. When an application is received for drainage, a surveyor is sent to look over the field, and, if the locality is suitable, a survey is made of the land and a working blue-print prepared for the use of the operators of the machine.

There has never been any lack of applications, there always being a number ahead in the office, and it has

been found impossible to catch up with the work since the machine was purchased. Sufficient applications are now on hand to keep the plant busy during the entire summer of 1916.

GOVERNMENT ASSISTANCE IN
UNDERDRAINAGE

The following are the regulations governing the operations of the traction ditcher, and conditions under which work is done:

The "Buckeye" traction ditcher owned and operated by this department for demonstrating its value, and assisting farmers in the underdrainage of their lands, will be operated during the season of 1915 upon the following terms:—

(1) Applications for the use of the machine should be sent before May first. Those received after that date will be subject to the time at the disposal of the machine. Preference will be given to those districts from which a number of applications are received in order to obviate the waste of time occasioned by frequent and long moves.

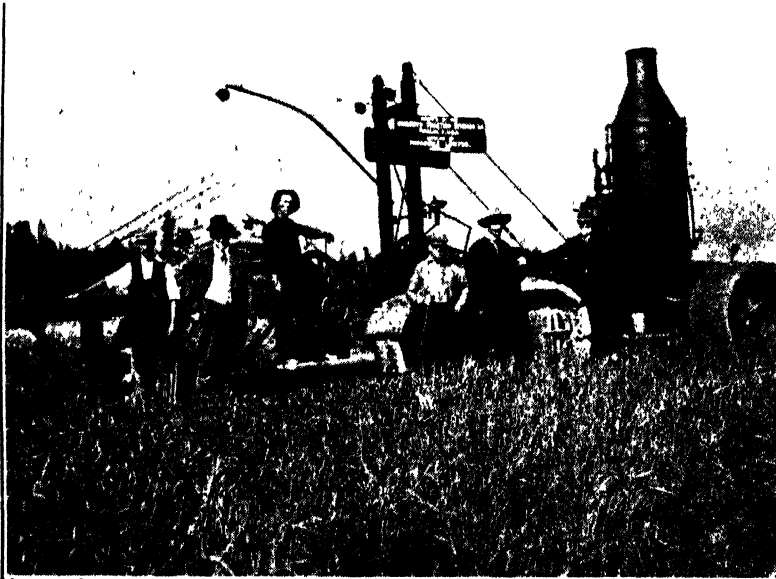
(2) Not more than 10 acres will be ditched for any one individual or company.

(3) The party for whom the ditching is done must agree to the following conditions:—

- (a) To convey to and from the railway station and board while engaged on the work, a surveyor furnished by the Department for the purpose of locating the drains and making any necessary arrangements; to accept the plan or system of drains laid down by him, and to lay the tile according to directions.

ditch exceeds the depth of three feet to a charge of one cent per inch in addition to the above.

- (d) To supply water for steam purposes and move fuel and incidentals necessary to the operation, at the direction of the operator, free of charge.
- (e) To provide board for the operators (two) at a rate current in the locality where the work is being done.
- (f) To make a settlement when the work is completed on the above terms.



THE TRACTION DITCHER OWNED AND OPERATED BY THE DEPARTMENT OF AGRICULTURE OF NEW BRUNSWICK

- (b) To have the tiles ready before the drains are dug.
- (c) To pay the sum of thirty cents per rod for a ditch three feet deep and fifteen inches wide, in ground reasonably free from stone with an extra charge not to exceed ten cents or a total of forty cents per rod when the ground has an excess of stone or other difficult conditions; and to accept the judgment of the officers of the Department in this connection; and further agree where the

APPLICATIONS

Write for application forms to the Soils and Crops Division, Agricultural Department, Fredericton, N.B.

NOTE:—Any farmer desiring expert advice as to the probable cost and advisability of drainage may, upon application to the Department, secure the services of the drainage surveyor. Such visits will not place the farmer under any obligation, but will be made subject to the time at the disposal of the engineer.

QUEBEC

BY J. ANTONIO GRENIER, DEPUTY MINISTER OF AGRICULTURE

THIS year, as usual, the School of Agriculture of Ste. Anne de la Pocatière and Macdonald College will be in charge of the under-drainage work under the provincial Department of Agriculture. Teachers of these institutions will act as superintendents of drainage experts. They will have under them a number of graduates, or undergraduates, who will shortly take a practical course in drainage in order to be able to prepare good plans for the farmers.

Last year 82 farms were visited by our experts during the summer, and plans were made for an area of 4,082 acres. Owing to the ever-increasing number of requests that are being received, it is likely that a much greater number of plans will be carried out during the next season.

The work is done as follows: Our men visit the farm to be drained, survey the ground, take the levels, at every 100 feet, and prepare a pre-

liminary plan, giving the location of the ground, the slope, the number and size of tiles required and a number of other details; this first plan is revised by the superintendent, a clean copy is made and sent to the farmer with the estimated cost per acre. Our experts are provided with the necessary material, such as levels, tripods, rods, gallons, etc.

The Department will also operate as usual the two "Buckeye" excavators that were purchased a few years ago. Each one of these machines is operated by mechanics, assisted by an expert when necessary, for the carrying out of the plan.

Last year, these excavators worked on a number of farms at Shawville, Pontiac county, in Trout River and Beith, Huntingdon county, at the School of Agriculture of Ste. Anne de la Pocatière and at the Domestic Science School of St. Paschal. They dug altogether 50,250 feet of trenches.

MACDONALD COLLEGE

BY G. E. EMBERLEY, LECTURER IN AGRICULTURAL ENGINEERING

THE following is an outline of the work carried on by Macdonald College in the matter of assistance in farm drainages. While no definite plans have been mapped out for 1916, it is quite probable that this work will be continued:

The College, with the assistance of the Provincial Department of Agriculture, offers assistance in drainage to the farmers of Quebec on the following conditions:—

The College will send, during the summer months, a drainage adviser to any farm in the province of Quebec. The adviser will make a drainage survey of the farm, and prepare a plan of the drainage system suited

to it, showing the location and grade of the drains, the number and size of tile, etc. The adviser will show the farmer how to dig his drain true to grade, how to lay the tile, make joints, etc. There is no charge for the services of the adviser, but the farmer for whom the survey is made is required to pay the adviser's travelling expenses, consisting of, for the round trip, the lowest regular one-way first-class railway fare and one-third, meals on the way, if any, and cartage of instruments, if any. The farmer must meet the adviser at the station and return him to it, board him while at work, and furnish him with the assistance necessary for the work.

MANITOBA

BY F. G. CHURCHILL, B.S.A., PROFESSOR OF SOILS, MANITOBA AGRICULTURAL COLLEGE

A brief study of Figure No. 1 will readily illustrate why it is necessary to drain in Manitoba. While the annual rainfall is only 21 inches at Winnipeg, and under average conditions is almost ideally distributed during the growing months, a glance at the figures for the years 1914 and 1915 will show how certain seasons differ from the normal and why it is very desirable to have the land well drained. During the month of July, 1914, the potato crop in the vicinity of Winni-

improve the drainage, first by large open ditches and then later by tile drainage. Previous to the year 1913, no tile drainage had been done in the Red River Valley, where it is most needed in Manitoba. During the year 1913, it was decided to drain a portion of the College farm in order to improve the land, and to obtain data regarding tile drainage under Manitoba conditions. A number of the problems which had been planned to solve were as follows:—

1. Will the frost injure the tile?
2. Will the tile carry away the water in the early spring?
3. What is the proper depth to place the tile?
4. How far apart should the lines of tile be placed?

WILL THE FROST INJURE THE TILE?

Contrary to the expectation of many, the frost has not injured the tile in a single instance. This is probably accounted for by the fact that the tile when properly laid will not contain any water when they freeze about the 15th of December, and that they will not thaw out until some time late

in the spring. This once freezing and thawing will not injure the tile, as does the alternate freezing and thawing which often occurs in countries having a milder climate than Manitoba. These statements are based upon careful observations made during both winter and summer.

WILL THE TILE CARRY AWAY THE WATER IN THE EARLY SPRING?

The past two years most of the main drains have started to flow on March 17th each year. On March

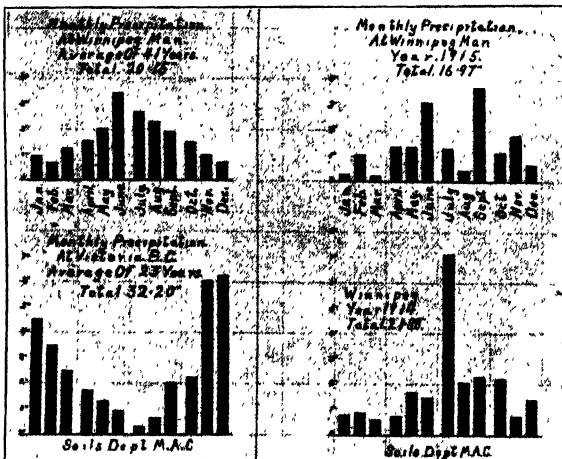


FIG. 1. TABLES SHOWING VARIATIONS IN RAINFALL IN MANITOBA

peg was very severely injured by the heavy rains, and the poorly drained soil. A general survey of the province of Manitoba would prove to us that while the greater portion of the province is fairly well drained, there are thousands of acres of land which are badly in need of improved drainage. This is plainly shown by Figure No. 2, which represents a portion of the College farm during the fall of 1912 before any drainage work was done at the College. In many places it will be necessary to

23, 1915, six out of eight main discharge from three was measured drains were flowing. The rate of and the following results obtained:—

Main A was discharging .21 gals. per sec. or 2803 cu. ft. in 24 hrs.
 " J " " .34 " " " 4690 " " 24 "
 " E " " .62 " " " 8572 " " 24 "

WHAT IS THE PROPER DEPTH TO PLACE THE TILE?

Tiles were laid at various depths from 2 to 4½ feet, in order to determine just what the best depth would be with the soil which we have under consideration. The following table, which gives the loss of ignition and

the mechanical analysis of the surface soil to a depth of 6⅔ inches, the sub-surface soil from a depth of from 6⅔ to 20 inches and the sub-soil from a depth of from 20 to 40 inches, will give accurate information regarding soils found on the College farm:

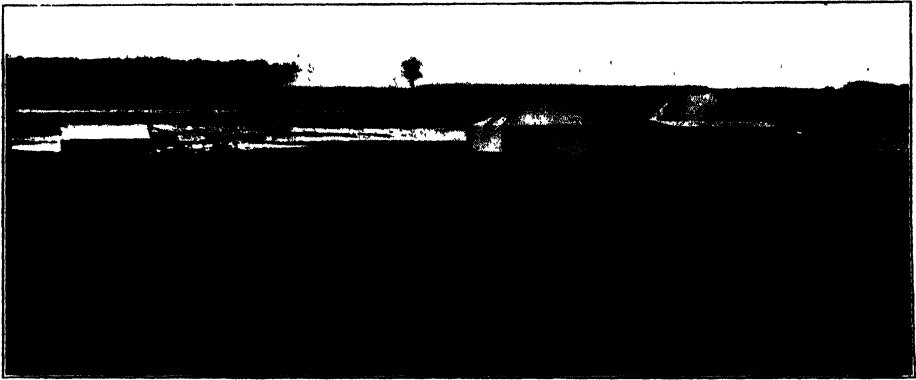


FIG. 2. PORTION OF THE MANITOBA AGRICULTURAL COLLEGE FARM BEFORE BEING DRAINED

This land was underdrained in 1913

SOIL	Loss on Ignition, Per Cent	Fine Gravel Per Cent	Coarse Sand Per Cent	Medium Sand Per Cent	Fine Sand Per Cent	Very Fine Sand Per Cent	Silt Per Cent	Clay Per Cent
Surface, 0-6⅔	10.90	.22	.62	.46	4.12	15.05	36.06	46.67
Subsurface 6⅔-20	7.74	.17	.85	.17	1.08	13.69	34.11	52.33
Subsoil 20-40	6.56	.13	.23	.18	1.35	21.60	32.56	45.23

The figures in the foregoing table indicate how fine textured the soil is, and if it were not for the good supply of organic matter indicated by the loss of ignition, the soil would be even harder than it is to cultivate. With this type of soil to handle, we have found that the tiles placed at a depth of from 2 to 2½ feet prove the more satisfactory. Of course, it is just possible that as the

soil improves in structure that the deeper drains may show an advantage.

HOW FAR APART SHOULD THE LINES OF TILE BE PLACED?

Up to the present time the work on the College farm has consisted of laying 26,500 feet of tile under land to be used for experimental plots, and for horticultural gardens. The

lines of tile in some places were laid parallel and 50 feet apart according to the gridiron system. In other places the tile was run in lines in the natural water course by the method known as the natural system. Where the land is to be used for market garden purposes the results indicate that increased yields may be expected by putting the drains even as close as 50 feet apart, but if the land is to be used for general grain crops, under ordinary conditions the most profitable returns can be expected by following the natural system,

WORK FOR 1916

While the exact plans for the year have not been drawn up, the following general outline indicates the nature of the work that we hope to be able to do:

1. Work on the College farm: This year it is planned to lay about 20,000 feet of tile under a portion of the farm that is to be used for general grain crops. It is intended to follow the natural system, laying the lines of tile in the low water courses. Comparing the results obtained from crops on this land with a portion of the farm yet undrained we hope to be able to advise more accurately regarding the advantage of draining for general grain crops.



FIG. 3. RESULTS OF UNDERDRAINAGE
Wheat grown in 1915 on land shown in Fig. 2

simply running the main drain into sloughs or natural water courses. Figure No. 3 shows a portion of the land shown in Figure No. 2. This land was tile-drained in 1913, and the figure shows the wheat crop produced on that land in 1915. At the present time a good deal of local interest is being taken by market gardeners regarding the results that are being obtained from the drainage work that has been done. Many of them are planning to try a little tile the present year if possible.

2. Co-operative work with farmers: If possible, it is intended to co-operate with five farmers in different parts of the province, securing a plot of ground of ten acres, draining five acres and leaving the other five acres undrained. In this way we hope to be able to spread the knowledge that we have gained from the work done at the College farm.

3. Aid in planning drainage systems: As in the past, we expect to continue surveying, planning and estimating the cost of draining for any farmers who care to have the work done. We have had a number of calls in the past, and while very little tile drainage has been done, a number of the farms in the province have been under-drained; and the land improved to a marked extent, even by the open drains.

LIME AS A FERTILIZER

NOVA SCOTIA

BY JOHN M. TRUEMAN, B.S.A., PROFESSOR OF AGRICULTURE AND FARM SUPERINTENDENT

EXPERIMENTS in the use of ground limestone were started at the Nova Scotia Agricultural College during the spring of 1914. Three plots of oats and three plots of wheat were treated with the limestone at the rate of 4 tons per acre. The limestone was distributed with a fertilizer sower over half of each plot before the wheat and oats were sown, and mixed with the soil by harrowing. The grain was put in with a regular grain drill, and timothy and clover seed sown at the same time.

No material difference was noticed in the yield of grain on the limed and unlimed parts of the plots. As soon as the grain was cut, however, the clover on the limed portions of most of the plots was found to be considerably ahead of that where no lime had been used. This difference became more noticeable as the fall advanced, and con-

tinued as soon as growth started in the spring of 1915. On two of the plots very little difference existed between the limed and unlimed portions. These plots were rich and in excellent condition for growing clover and a heavy crop was obtained whether lime was used or not. This agrees with our previous observations that lime does best on soils of medium richness. On poor soils there is not enough humus and plant food present to grow a big crop and lime does not furnish the necessary food, therefore, the results are poor. On rich land, however, conditions are often so good that big crops of clover are obtained even without the application of lime.

The following table shows the size of plots and yields obtained. It should be noted that these plots are larger than many experimental plots and represent actual field condition:

NUMBER OF PLOT	Size	Amount of Cured Hay	Yield per Acre
1	1 acre ($\frac{1}{2}$ unlimed)	2550 lb.	2 5 tons
	" ($\frac{1}{2}$ limed)	3610 "	3 6 "
2	1 " ($\frac{1}{2}$ unlimed)	2570 "	2 6 "
	" ($\frac{1}{2}$ limed)	3090 "	3 2 "
3	$\frac{1}{2}$ " ($\frac{1}{2}$ unlimed)	1160 "	2.3 "
	" ($\frac{1}{2}$ limed)	1490 "	3 0 "
4	$\frac{1}{2}$ " ($\frac{1}{2}$ unlimed)	1150 "	2.3 "
	" ($\frac{1}{2}$ limed)	2010 "	4 0 "
5	$\frac{1}{2}$ " ($\frac{1}{2}$ unlimed)		
	" ($\frac{1}{2}$ limed)	3650 "	3.6 "
6	$\frac{1}{2}$ " ($\frac{1}{2}$ unlimed)		
	" ($\frac{1}{2}$ limed)	3050 "	3 1 "

It will be seen from the above table that the gain from the use of limestone was not uniform. On plot No. 1 the increase in favour of limestone was a little over one ton per acre, while on plot 2, it was only a little over half a ton per acre. On plot 3 the difference was 1,320 lb., while on plot 4, it was nearly one and

three-quarter tons. On plots 5 and 6 the yield was practically the same on both sides of the plots. The only explanation we can offer for the lack of results on the last two plots is that the soil was in such good condition that it grew clover well even without the use of lime.

The total yield in favour of lime on the two acres amounted to 1.4 tons. This at \$10 per ton is worth \$13.85. The amount of lime applied to the two acres was 8 tons. The returns from liming even in the past season were not confined to the one cutting of clover. The second growth was very luxuriant and the difference in favour of the limed parts was about 0.8 tons per acre. The total increase for the year was, therefore, 2.2 tons. It will be interesting to note the results of this experiment on the second year's hay crop in 1916.

If the greatest difference in yield shown by any plot was taken as the basis for calculation, we would find on plot No. 4 a gain of 1 ton 1,440 lb., worth, at \$10 per ton, \$17.20. This as the result of the application of 4 tons of limestone would look like a profitable investment, especially when future crops are considered. This method of figuring would not be fair, however, and illustrates clearly

the need of duplicating experiments

The results also show clearly the need for each man to test his own soil, and it would seem like a wise undertaking for every farmer interested to treat at least one acre, and to use enough limestone to be sure of his results.

It is claimed by experts on plant diseases that lime will kill out the club root of turnips and cabbages. Our crop of turnips this year was reduced to some extent by this disease. On that account we are applying 5 tons of ground limestone per acre this fall to the field where turnips will be grown next year. If thorough liming will rid Nova Scotia farms of club root, it will be of great value to our farmers.

Further experiments with lime on oats and new seeding were started in 1915. The effect upon the oats was small, corresponding with results obtained last year, but we will look for the effect on the clover this year with great interest.

ONTARIO

BY R. HARCOURT, B.S.A., PROFESSOR OF CHEMISTRY, O. A. C., GUELPH

I may say that we have some results in on the lime experimental work.

The fact that lime will improve sour soils is so well marked that we have not spent so much time in proving this point as in endeavouring to get a cheap source of lime. Last season was so wet that the great majority of the experimenters report that they could see no results of the application of lime, and I hardly expected that they would this year. The experiments that we placed last spring were all with the limestone screenings, which being rather coarse is slow in its action and, except where it was applied in very heavy dressings, no effect was seen. We will probably see more this year. Mr. Clement, Supt. of the Vineland Fruit

Experiment Station, reports "no observable effects from application of lime on their place during the summer of 1915". I am disappointed in this because I expected to see some results there. I am inclined to think that from results got here and elsewhere that in many cases we have not applied the lime heavily enough, that is, the soil is too sour to respond to a comparatively small amount of lime. We never have been able to get any results from application of lime at Guelph; this is because there is abundance of it in the soil and applications of it are consequently useless. We have the limestone screenings applied to clays growing clover and alfalfa in several places, and hope to have results another year.

MANITOBA

BY F. G. CHURCHILL, B.S.A., PROFESSOR OF SOILS, MANITOBA AGRICULTURAL COLLEGE

AS we were not located upon the present farm until the fall of 1913, it is impossible to give any very authentic data on the use of fertilizers. In the fall of 1913 the horticultural gardens were tile-drained by means of the grid-iron system, placing laterals 100 feet apart. The following year, 1914, a portion of the land drained did not respond to the drainage as it should, probably due to the impervious nature of the clay sub-soil. It was decided to try an application of one ton of lime upon an acre of this land which was not giving the desired returns. The lime was applied during November, 1914. The past year, 1915, this acre of ground was materially improved in structure, due probably partially to the application of lime, and partially to the fact that it had been drained one year longer, and, hence, the gradual improvement of the structure.

In the spring of 1915, lime was used along with some other fertilizers on plots which were seeded to oats. While these plots were not harvested separately, careful observations were made during the summer and they lead us to conclude that very slight increase in

yield, if any increase at all, was due to the use of lime as far as oat production was concerned.

During the second week of May, 1915, two one-tenth acre plots of three-year-old alfalfa received the following treatment: Plot No. 1 received 300 pounds of air slaked lime, and plot No. 2 received 600 pounds of ground limestone. These two plots did not show any increase in yield in 1915, but perhaps will in the future.

A field which was seeded to alfalfa in the spring of 1915, showed the presence of acid soil and by the first of August a portion of the alfalfa seedlings had killed out entirely. During the first week of August an application of lime at the rate of $4\frac{1}{2}$ tons to the acre was applied to two acres of this acid soil. The intention is to re-seed this to alfalfa next year, and see if the lime has corrected the acidity.

From the foregoing, it can be seen that we have hardly had time to draw any conclusions regarding the use of lime upon the Red River Valley soil. As a rule, we find the soils of Manitoba contain a good supply of lime, and it is very exceptional to find an acid soil.

SASKATCHEWAN

BY JOHN BRACKEN, B.S.A., PROFESSOR OF FIELD HUSBANDRY, COLLEGE OF AGRICULTURE, SASKATOON

WE got our first data from our fertility project in 1915. Having only one season's data to hand, we are drawing no conclusions from them. However, I may say that the use of finely ground limestone, the only form of lime we are using, increased the yield of mixed grasses, roots, potatoes and corn considerably. It was applied at the rate of 1,000 lb. per acre on the surface of the fallow in the latter part of August the year before the crop was grown. The same application did not materially affect the yield of alfalfa or wheat.

The different fertilizers were applied to a brown clay loam soil over a clay subsoil. From observations made in other places throughout the province, it is very apparent that limestone will be of value on our soil only in proportion to the improvement it affects in the physical condition of some of our heavier, tighter clays. Chemical analyses already made of many of our soils seem to indicate that there is sufficient lime present to serve the need of the plant and to maintain a neutral or alkaline condition of the soil.

ALFALFA SEED PRODUCTION AND INOCULATION

MACDONALD COLLEGE

BY JAS. MURRAY, B.S.A., PROFESSOR OF FIELD HUSBANDRY

THE scarcity of seed of the hardier varieties of alfalfa is one of the principle reasons why in eastern Canada the acreage in alfalfa is decreasing year by year. This condition is not likely to be corrected until a greater effort is made to produce alfalfa seed in those districts where only the hardiest varieties will survive the winter. The central western states, Nevada, Utah, Kansas, Arizona and Wyoming at present supply most of the seed sold in Canada, and, as the alfalfa grown in these states is largely the true alfalfa, *Medicago sativa*, which is not winter hardy in many parts of Canada, the results are frequently very unsatisfactory on account of winter killing.

The variegated alfalfas, *Medicago media*, which includes such varieties as Grimm, Baltic and Ontario variegated, have by repeated tests in both eastern and western Canada proven best adapted for extended cultivation. To increase the supply of seed of these varieties is, therefore, of vital importance to the future of alfalfa growing in Canada. The high market price of genuine seed of the variegated alfalfas that has obtained for several years might have been expected to have greatly stimulated production, but the amount of seed annually on the market is still limited in amount and inadequate to meet the demand. While this is being corrected to a limited extent by the growing of seed in Ontario and the prairie provinces, principally in Alberta,

there is still urgent need for an extension of the acreage devoted to producing alfalfa seed.

The alfalfa seed crop is regarded as precarious even in the districts best adapted to it. It is very variable from year to year according to the weather that prevails, more particularly after the plants start to bloom. In some seasons, conditions may favour a seed crop from the first growth of the season instead of the second, although it has been rather generally accepted on inadequate proof that the seed crop in this latitude should be the second.

In addition to the weather there are a number of factors that enter into the problem of alfalfa seed production and some of these have been under investigation for several years in the Cereal Husbandry Department of Macdonald College. The factors that have been considered include:—

1. Methods of seeding:—
 - (a) broadcast
 - (b) in cultivated rows
2. Rate of seeding:—
 - (a) broadcast
 - (b) in cultivated rows
 - (c) distance between rows
- 3 Pure vs. mixed cultures.

EXPERIMENTS IN 1914

Following is a summary of the results of 1914, from a seeding made the previous year. Grimm alfalfa was used throughout. The first crop was cut for hay and the seed taken from the second crop.

RESULTS OF EXPERIMENTS

LAND USED	Area in Acres	Method of Seeding	Yield per Acre Lb.
N. W. Field Range 11.....	.750	Broadcast—20 lb. per acre.	42
“ 10 } “ 17 } “ 18 }	2.352	Broadcast—Mixture of alfalfa, tall oat grass and orchard grass.	49.6
“ 12.....	42	In rows—4 links apart. 5 lb. per acre.	160.12
“ 12 .....	.3375	In rows—3 links apart. 5 lb. per acre.	141.48

These results strongly favour the row method over the thick seeding broadcast, and show little difference between the pure and mixed broadcast sowings.

RATES OF SEEDING IN ROWS—1914—
ROWS—3 LINKS APART. SOWN 1913

Rate of Seeding	Yield per Acre, lb.
3 lb. per acre ..	125
6 “ “ ..	113
9 “ “ ..	95 3
12 “ “ ..	80.36
15 “ “ ..	68 85

RATES OF SEEDING—BROADCAST—1914
SOWN 1913

Rate of Seeding	Yield per Acre, lb.
5 lb. per acre ..	157 5
10 “ “ ..	122 5
15 “ “ ..	115
20 “ “ ..	93 75
25 “ “ ..	80.

In both methods of seeding the yield of seed decreases as the thickness of the stand increases. The figures would appear to indicate that the broadcast sowing is prefer-

able to the row system, but it should be borne in mind that a seeding of only 5 lb. per acre broadcast would give a stand that under ordinary farm conditions would soon become infested with grass and weeds and be quite unsuitable for growing seed. A thin stand in rows is not open to the same objection as it can more readily be kept clean by cultivation.

EXPERIMENTS IN 1915

The past season has been a poor alfalfa seed year in all parts of Canada. Where seed growing was contemplated the first crop was as usual cut for hay, and the second allowed to stand for seed. The wet weather so general in both eastern and western Canada in July and August did not favour the fertilizing of the blossoms and a very poor setting of seed resulted. In the Cereal Department, we had a very light crop of seed, but in this case it cannot be attributed to wet weather as we had practically no rain during July or the first half of August. The extreme drought is more likely responsible for the low yields given below.

METHODS OF SEEDING, 1915. SOWN 1913

LAND USED	Area in Acres	Method of Seeding	Yield per Acre, Lb.
N. W. Field Range 12 .....	.42	In rows—4 links apart. 5 lb. per acre.	64.29
“ 12.....	.3375	In rows—3 links apart. 5 lb. per acre.	71.11
“ 17 and 18	1.847	Broadcast—Mixture of alfalfa, tall oat and orchard grass.	24.95

Range 11, sown broadcast in 1913 at the rate of 20 lb. per acre, produced, as already noted, a light crop of seed—42 lb. in 1914. In 1915, it was a complete failure owing, at least, partly to the depredations of grasshoppers. There was an extremely poor setting of seed and the grasshoppers seemed greatly to prefer the broadcast seeding to that in rows, as the adjoining Range 12 was injured very little by them.

The yields given above are all low, but those in the row seedings are well above the others, and are, considering the present high price, profitable.

It is scarcely necessary to point out that several years further work is required before any definite rules can be laid down for the production of alfalfa seed in this part of Canada. But the results of these experiments, coupled with the experience of farmers in Ontario and Quebec, would seem to justify the statement that in the majority of years alfalfa, when properly handled, will produce enough seed to make a fair profit, assuming, of course, that only hardy variegated varieties are grown. Certain districts will undoubtedly prove better adapted to seed growing than others, but while genuine hardy seed continues to be as high in price as it is at

present an effort should be made to grow it whenever possible. When the market price falls, as it surely will, seed growing can be left to those districts where the best crops can be grown.

During the year 1915 about 1,200 applications for alfalfa culture at Macdonald College have been received and dealt with. Each culture supplied is sufficient to inoculate 30 lb. of seed and full direction accompany it. Only one shipment of inoculated soil was made, this being to a man who had sown his seed without inoculation and who intended harrowing in the inoculated soil after the alfalfa was several inches high.

When alfalfa is being sown on land that has not previously produced the crop it is essential that the soil be inoculated with the bacteria that enable the alfalfa plants to utilize the nitrogen of the air in their growth. The method of inoculating is of little importance. Where soil from the established field of alfalfa can be conveniently and cheaply obtained *without the danger of introducing the seeds of new weeds* the soil might to advantage be used. But under other circumstances the laboratory culture will be found more satisfactory.

MANITOBA

BY T. J. HARRISON, B.S.A., PROFESSOR OF FIELD HUSBANDRY, MANITOBA AGRICULTURAL COLLEGE

ON the roots of the thrifty growing alfalfa will be found small white lumps or nodules. These are the laboratories of millions of bacteria that are converting the nitrogen of the soil air into a solid form that can be used by the plant. In the prairie soils of Manitoba there is not sufficient nitrogen to produce a paying crop of alfalfa, so if this crop is to be grown successfully the supply of available nitrogen must be aug-

mented by the nitrogen—fixing bacteria. In very few places in the province are these bacteria found in the virgin soil; therefore, it becomes necessary for the farmers to supply them in some form.

This is known as inoculation and may be done by either of two methods. The soil inoculation consists of spreading 100 to 300 pounds of soil from a thrifty growing alfalfa field on each acre of land intended to be seeded down. To obtain the best

results the soil should be spread as soon after digging as possible. The application can be made most easily at the time the seed is planted. The soil is supplied in 100 to 200 pound lots by the Field Husbandry Department, Manitoba Agricultural College, Winnipeg, to all residents in Manitoba who remit sufficient money to prepay the freight charges and cost of sack. In past years large quantities of this soil were sent out during the months of May and June, but in recent years less is being supplied because more people are adopting the method of seed inoculation. This consists in applying to the seed, the bacteria which have been grown artificially by the bac-

teriologist. The nitro-culture, as the substance is called, can be secured from most of the seed houses, and also from the Bacteriological Department, Manitoba Agricultural College.

Quite extensive experiments were conducted by the College some years ago to determine which method gave the best satisfaction. The results of these experiments seem to show that so far as the inoculation was concerned, and where care was exercised in the application, practically no difference could be observed. Since the latter method is considerably cheaper and easier, it is now the method recommended by the Field Husbandry Department.

SASKATCHEWAN

BY JOHN BRACKEN, B.S.A., PROFESSOR OF FIELD HUSBANDRY, COLLEGE OF AGRICULTURE

THE season of 1915 was not a favourable one for alfalfa seed production in Saskatchewan. The spring frost in the middle of June froze the early blossoms and put the seed crop back several weeks. When the crop next came in bloom, the moisture conditions were so favourable that it tended more to the pro-

duction of leaves and forage than to the setting of seed.

The following table gives the yield of seed secured at the Saskatchewan College of Agriculture from Grimm alfalfa planted in rows different distances apart and at different rates per acre during the past two years:

ALFALFA SEED YIELDS—SASKATOON, 1915
(NO HAY CROP TAKEN)

	Rate per Acre	Yield, 1914	Yield, 1915	Average
6" rows.....	15 lb.	30 lb.		
12" ".....	12 "	81 "	72 ½ lb.	76 ¾ lb.
18" ".....	6 "	78 "	73 ¾ "	75 ⅞ "
24" ".....	4 ½ "	91 "	71 ¼ "	81 ⅛ "
30" ".....	8 "	47 ½ "	41 ¼ "	44 ⅜ "
36" ".....	3 "	116 "	100 "	108 "

ALFALFA SEED YIELDS—SECOND CROP—SASKATOON, 1915
(FIRST CROP REMOVED FOR HAY)

	Rate per Acre	Yield, 1914	Yield, 1915	Average
6" rows.....	15 lb.	20 lb.		
12" ".....	12 "	40 "	29 lb.	34 ½ lb.
18" ".....	6 "	60 "	29 ½ "	44 ¾ "
24" ".....	4 ½ "	86 ½ "	28 ½ "	57 ½ "
30" ".....	8 "	47 ½ "	16 ½ "	32 "
36" ".....	3 "	82 ½ "	40 "	61 ¼ "

BACTERIA CULTURES FOR ALFALFA

Many applications have been received at the office of the Department of Field Husbandry for alfalfa bacteria cultures. These were referred to other institutions, or to commercial houses for the reason that no cultures are produced and distributed from the college.

In the year of 1911 which was a very wet summer with us, the use of Farmogerm increased the yield of Grimm alfalfa 1,300 lb. and the use of inoculated soil increased the yield 1,000 lb. per acre over the same variety where no culture was used. In that season it was very apparent that moisture was not the limiting factor in crop production and the use of the bacteria, therefore, increased the yield considerably.

In the following year the alfalfa on these plots was left for seed and no yields for forage were taken. This was a dry year and it was very apparent all through the summer that the plots that produced the large yields the previous year were con-

siderably less productive than the one that produced the small yield. This we attributed to the fact that the larger yield in 1911 used up more of the soil moisture, and in 1912 when moisture, and not nitrogen, was a limiting factor in the yield, they showed up less well than the uninoculated plot.

During the past few years we have done some work with bacteria cultures produced by several private concerns and by different public institutions. Our tests of the culture handled by different concerns have given us nothing definite to report. Our observations incline us to the opinion that the use of inoculated soil is safer than the use of pure cultures. On the other hand, the best of the cultures we have tried have, under favourable conditions, given us better returns than we have been able to secure from soil. Farmogerm is much the more costly of all the cultures we have used. It has, however, seemed to give us rather better satisfaction than many of the others.

Every county in England and Wales reports a shortage of farm labour with wages increasing. Yorkshire, Surrey, Kent and Sussex place special emphasis on the shortage of horsemen. Arrangements have been made for the employment of soldiers on furlough and convalescents, at a rate of four shillings a day if the man provides his own board and half a crown if he does not. Railway travelling is to be free to such labour.

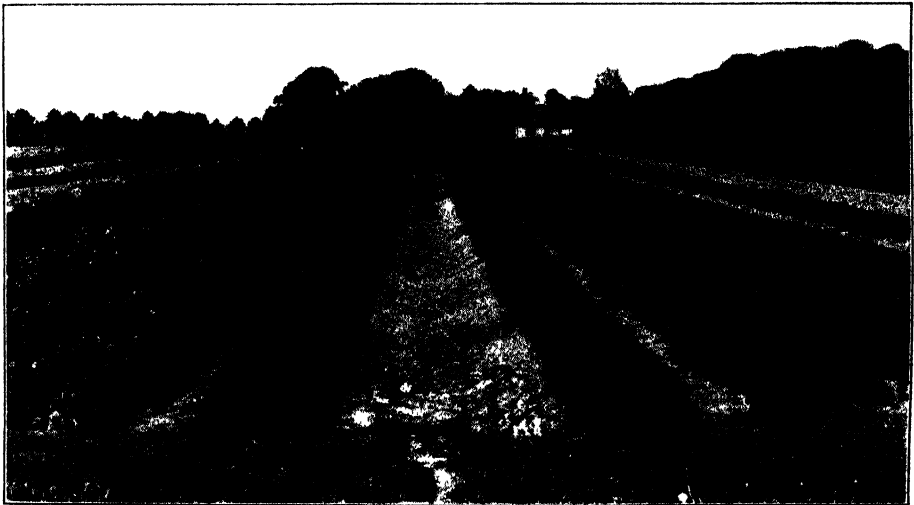
THE INDUSTRIAL FARM SYSTEM

ONTARIO

BY S. E. TODD, B.S.A., DIRECTOR OF FARMS

PROBABLY the biggest farmer in the province of Ontario is the Provincial Government. The Provincial Secretary of Ontario, the Honourable W. J. Hanna, has charge of a group of farms that are notable for a variety of reasons. They form a chain throughout the province that for demonstration work is more representative than any other group of publicly owned farms in the province. Beginning at the

remarkable because at these places are congregated that portion of the population of the province that society has found unsuitable for the various vocations. They are either the unfortunates who, through mental and physical illness, society has been unable to deal with successfully, or they are persons who through depravity or weakness have also been despaired of. To the Department of the Provincial Secretary these in-



VEGETABLES IN SEWER GARDEN, LONDON, ONTARIO

east they are situated at Brockville, Kingston, Cobourg, Whitby, Mimico, Hamilton, Guelph, Woodstock, London, Orillia, Penetang, Sudbury, Fort William and Burwash, being in connection with the various hospitals for insane, feeble-minded, epileptics, and the Ontario Reformatory. They are peculiarly representative of the local variations in soil conditions, climate and crops. They are also

valids and rejects have been handed over to be cared for and supported. Much of the work of the farms is done by these classes.

AN ECONOMICAL PROBLEM

It is being demonstrated that not only may these classes be successfully handled under proper discipline, but that in many cases work is the antidote for their ills. They are also

remarkable because they are the only extensive group of publicly owned farms in Canada whose main reason for existence is for the purpose of producing food for consumption. At these farms the first real study is being made as to whether it is possible to utilize the labour of the inmates of such institutions as to be economically successful. The problem being worked out, especially at the reformatories and industrial farms, by actual experimentation and demonstrations may be the answer to one of the greatest social problems, and one that has always been the despair of society, namely, how to deal with the mentally and physically unfit. For years society has despaired of finding a method to

public institutions he found that little thought indeed was being given to the problem of what the inmates could do in the way of self support. The hospitals at London and Hamilton had fair farms and gardens, a number of the other institutions had gardens, but little in the way of farms. The Ontario Reformatory was the Central Prison at Toronto, bounded by the brick walls and iron gates of that gloomy keep. The Industrial Farm had not been thought of. No place had been provided, except the filthy jails and lockups of the small towns to deal with the vagrant, the drunk, the weak and the temporarily out-of-work. Since then considerable areas have been devoted to farming and new farms



WOMEN PATIENTS WORKING IN GARDEN, LONDON, ONTARIO

deal with the high-class imbecile, the feeble-minded and the criminally inclined. It is essentially an economic problem. Prove that it is economically feasible to segregate these classes, and to teach them to earn their living, and thus not to burden the province unduly, and the remainder of the problem is capable of solution. It is the solution of this problem that the administrators of the farms and other industries of the public institutions are studying with much earnestness and in the strong hope of solving.

INCEPTION OF THE SYSTEM

When the Honourable Mr. Hanna undertook for the Ontario Government the work of administering the

established, until now the acreage so applied at Brockville comprises about four hundred acres, Kingston one hundred and seventy, Whitby (to which Toronto Hospital for Insane will be transferred) five hundred and fifty, Mimico, two hundred and thirty, Hamilton, five hundred, Woodstock, four hundred, London, five hundred, Guelph, seven hundred, Orillia, four hundred, Penetang, two hundred, Sudbury Industrial Farm, Burwash, thirty thousand, Fort William, twelve hundred acres, all exclusive of grounds and parks.

PRACTICAL APPLICATION OF INSTITUTIONAL CO-OPERATION

A definite plan is being worked out so as to link up the farms at the

different places; the climatic, soil and local conditions are being given careful study; that which each place can produce to best advantage is being raised at that place, and the products are being interchanged to mutual advantage. The production of milk is a big factor at the hospitals, some five hundred dairy cattle being kept at these places. The actual milking herds aggregate about three hundred. From these some three million, one hundred and fifty thousand pounds of milk were produced last year. At the places where the pasture area is restricted the Holstein is used exclusively, except at Penetang, where, on account of rough pastures and bush land, the Ayrshire has been found to succeed

there are now killed and prepared the meats consumed in all the public institutions in the province. Fertilizer is prepared and every part of the animal utilized. The woolen factories at the Ontario Reformatory, where blankets, cloth, etc., for the institutions are manufactured, will take the wool from the sheep on the ranches and the abattoirs will prepare the meats of sheep, cattle and hogs. These latter institutions will produce all the pork required. Hamilton, with its advantageous climatic conditions, has been developed toward the production of peaches, cherries, plums, pears, grapes, bush fruits, apples, etc. A canning factory has been established there where such canned goods as are



THE DAIRY BARN AND BUTTER FACTORY, PROVINCIAL FARM, GUELPH, ONTARIO

better. At the Ontario Reformatory Guelph, where not so much milk is required, butter for the supply of the hospitals is being produced. At Fort William and Burwash plans are laid to develop large herds of beef cattle and flocks of sheep to supply meat for the other institutions. Four of the hospital farms, Brockville, Whitby, Orillia and Woodstock, are developing dairy Shorthorn herds to supply not only milk for the hospitals but calves that will grow into beef at the ranch at Burwash. At Burwash it is planned to produce some two thousand beef cattle per year to supply the other institutions, as well as large flocks of sheep. At the Ontario Reformatory an abattoir of the latest design has been built and

required by the institutions are manufactured. At London heavy plantations of apples have been made and corn and tomatoes are specialized in and canned at the canning plant.

INDUSTRIAL METHODS

In working out the co-operative idea, Mr. S. A. Armstrong, assistant Provincial Secretary, has established a great system of factories at the Ontario Reformatory, where wood-working shops produce all the furniture, wooden building material such as sash, frames, doors, trim, etc., required in the erection, extension and repairs and furnishing of the hospitals. The iron-working shops produce hospital beds besides tables and

all kinds of enameled iron furnishings for hospital use. At Mimico, a magnificent deposit of brick and tile shale has been found, and here are manufactured brick flooring and roofing tile, land tile, sanitary cove and all the clay products used in the

for the planing mills and furniture factories at Guelph. Guelph returns to Burwash the finished article in doors, windows, etc.

In all the work inmate labour is utilized to the utmost. The co-operative idea that is being applied



THE DAIRY HERD AT THE PROVINCIAL FARM, GUELPH, ONTARIO

erection of the institution buildings. Many of these clay products are not manufactured elsewhere in Canada, but are imported from Wales and the United States. Burwash is producing from her forests the lumber

to the institutions, and, when thoroughly worked out, will undoubtedly do much toward solving the great problem of the support of the mentally and physically unfit.

ALBERTA

BY T. DAWSON, M.D., MEDICAL SUPERINTENDENT

A farm is operated in connection with the Hospital for the Insane at Ponoka. When the hospital was opened five years ago, the farm was rough unbroken prairie land. Three hundred and twenty acres of the best of it has been cleared and ploughed and what is left we are clearing gradually. The location is two miles south from Ponoka, viz., Sec. 33, township 42 and range 25, and the Government owns eight hundred acres.

The hired help consists of a farmer, cowman, and two teamsters. Most of the work is done by patients under the supervision of attendants. As soon as they begin to improve most

patients are eager to do outside farm work and benefit, both mentally and physically. The farm is run entirely to supply the needs of the institution. We can grow an ample supply of vegetables to last us from one year to another and the quality is excellent. The crops this year yielded on an average—oats, forty-eight bushels per acre; wheat, twenty-four bushels per acre, and barley, twenty-nine bushels per acre.

We have from fifty to sixty cows to supply milk and butter to the institution. So far we have had to buy some butter and feed for stock, but in course of time we should be self supporting.

THE PROVINCIAL GAOL

BY J. H. RIVERS, M.D., WARDEN

IN connection with the provincial gaol at Lethbridge, we have a farm of 680 acres. Negotiations are underway at present to purchase an additional 340 acres. We are located in Sec. 35, in 8-21-W-4, in the irrigation belt. We have no water right for 240 acres, so that we carry on two distinct methods of farming, dry and irrigated. We are situated four miles east of the city, almost directly across the road from the Dominion Experimental Station.

During the winter months we draw large quantities of manure from the stables in the city and use it on our land as fertilizer. We try to summer fallow a considerable acreage each year and find this the most certain way to get definite results. This is the only sure way to get a crop on the dry or unirrigated land. Conditions as to moisture here were ideal last season with the result that we obtained splendid yields. Our Marquis wheat yielded over 60 bushels per acre and our Banner oats over 110 bushels per acre. Potatoes and other root crops did equally well. We grew 35 acres of potatoes and about the same of mixed vegetables, thus affording plenty of healthy exercise for our inmates in the open air.

We clothe our men in ordinary labourers' clothes—blue denim—and allow them great liberty on the farm, so that an onlooker would not know them from ordinary hired labourers. They work outside on the farm every day in the year that the weather is fit and we have work to do. This keeps them in good condition physically, and must result in their moral improvement.

We employ a farm superintendent, who has charge of all details in connection with this work, working in harmony with the prison authorities. Under his supervision the work is done by the inmates, who thus obtain a practical knowledge of the two great systems of intensive farming—irrigated and unirrigated.

We go extensively into hog raising, having 200 or 300 head on hand all the time. We also have over 100 head of cattle, raising our own meat for use at the institution. We raise poultry to supply our own needs.

We have made great advances in the treatment of prisoners from the days that they "*did time*" shut up in their cells, and we have great confidence in the beneficial effect produced on these men by work on our farms.

It is the nature of infamies, as well as of diseases whose progress is not checked, to daily grow worse; and if the present-day wasteful and depraved practice of denuding the world of one of its most valuable natural resources (wild birds), is not checked, there will be wrought a mischief, a universal disaster, more awful in its results than words can express.

—James Buckland in "*The Value of Birds to Man.*"

NOVA SCOTIA

BOYS' TURNIP GROWING COMPETITION

BY F. L. FULLER, SUPERINTENDENT AGRICULTURAL SOCIETIES

IN the year 1911 Mr. A. N. Faulkner, a former Nova Scotian residing in New York, conceived the idea of doing something to assist in promoting agriculture in his native province. Being a decidedly practical man, he proceeded immediately to get his ideas into practice. The first knowledge the Agricultural College staff had of this scheme, or of the man behind it, was when Principal Cumming received a letter from him outlining a plan of giving prizes to boys between the ages of fifteen and twenty years growing the best acre of turnips on their father's or guardian's farm, and offering to supply the funds for such competition providing the Agricultural College staff would take charge of it.

RULES AND REGULATIONS

The competition as inaugurated included the counties of Cumberland and Colchester and was as follows:

For the boy between the age of fifteen and twenty years growing the best acre of turnips on his father's or guardian's farm, the assessed valuation of which did not exceed \$3,000.

First prize.....	\$75 00
Second prize.....	50 00
Third prize.....	30 00
Fourth prize	20 00

Mr. Faulkner further stipulated that the money be used for the following purposes:—

1. The pursuit of an agricultural education.
2. For purchasing live stock.
3. Underdraining or otherwise improving his farm.
4. In such other manner as may be agreed on by the committee.

The committee referred to is made up of two members of the College staff and a prominent farmer.

To this the Department of Agriculture authorized the following to

be inserted in the winter fair premium list:

"The prize winners in the Turnip-Growing competition are expected to exhibit at the Maritime Winter Fair, one-half dozen roots from the prize-winning field, together with the following information:—

1. Name and address of grower.
2. Dates of sowing and harvesting.
3. Kinds and quantities of fertilizers used.
4. Yield per acre.
5. Methods of cultivation.
6. Cost of production per bushel.

Where prizes will be offered as follows First, \$5.00; second, \$4.00; third, \$3.00; fourth, \$2.00."

A close observer of this competition cannot fail to be impressed with the generosity, careful thought and deep foresight of the man who conceived this idea; first, in selecting a crop which occupies such an important place in Maritime Province agriculture; second, in confining it to boys who in a few short years will be the leaders in agricultural affairs; third, by confining the competition to average rather than wealthy farmers' sons, and also including emigrant boys who signify their intention of making this province their home, and, finally, by limiting the expenditure of prize money to objects which tend to promote the highest class of agriculture and the highest type of citizenship.

For two years Mr. Faulkner supplied the necessary money for a competition in the counties named.

In 1914, the Provincial Department of Agriculture, with the assistance of the Seed Branch of the Federal Department of Agriculture, announced its willingness to provide one-half the necessary funds for a similar competition in any county

in the province, providing the balance was raised by private subscription. That year E. M. McDonald, M.P., Hon. R. M. McGregor, M.P.P., and R. H. McKay, M.P.P., supplied the necessary amount for Pictou county, and Mr. Faulkner again provided for Cumberland and Colchester counties.

THE COMPETITION IN 1915

Last year there were six counties in the competition. Mr. Faulkner expressed a desire to assist other counties and chose Inverness and Guysboro. Mr. D. G. Kirk provided for Antigonish, the same gentlemen again came to the assistance of Pictou, members of the Halifax Board of Trade looked after their county, while a number of gentlemen headed by Mr. James Fulton, made it possible to keep up the good work in Colchester county.

In referring to the yield of plots in the competition, I would like to explain that 1912, the year in which the beginning was made, was the most favourable for the growth of turnips for many years. Furthermore, the counties chosen are among the best in the province. In that year the average yield of prize-winning fields, per acre, in Colchester county, was 1,231½ bushels; in Cumberland county, 869. In 1913, Colchester prize winners averaged 1,138 bushels, and the Cumberland boys had an average of 1,250 bushels per acre. In 1914, Colchester again led with an average of 1,229 bushels, while Cumberland dropped back to 1,065. Pictou came in for the first time with an average of 1,064 bushels.

Last year six counties entered the contest. The season was the most unfavourable for the growth of turnips for years, and three of the counties were in the competition for the first time, and were not considered favourable for the growth of this crop. Yet, by careful and thorough cultivation, the boys were able to produce a crop far above the

average and one which for stock food cannot be equalled by any other crop in this province.

The yield in bushels of the prize winning fields was as follows:

Antigonish.....	761	Colchester.....	991
Guysboro.....	713	Halifax.....	769
Inverness.....	800	Pictou.....	763

This makes the average yield of the prize-winning fields for the four years the contest has been conducted 1,037 bushels per acre. Following up the matter of yield, we find that the average yield per acre of twenty-eight competitors in the year 1914 was 962 bushels per acre. The average yield given in the Canadian Year Book for that year was 394½ bushels.

No doubt there are many men like Mr. Faulkner of New York, and the other gentlemen in Nova Scotia, who would like to do something to promote agriculture, but who are at a loss to know how to do it. To such I would commend such contests as the turnip growing contest in Nova Scotia. Admittedly, there is nothing exciting about such a contest, but the results will prove of far more substantial benefit to the country as a whole than those more exciting contests which attract so many people. So far as the Maritime Provinces are concerned turnips are just as important a food for cattle as "neeps" in Scotland. More turnips mean better fed cattle and more cattle and more fertile farms, bigger crops and more wealth. The contest, in so far as it will lead to this is of fundamental importance.

One, who is interested in promoting agriculture wherever it may be carried on, can only wish that others may take up the matter of encouraging among the young men of the country the growing of crops that will lead to a real development in the agriculture of the country, and it is in the hope that the idea may "catch on" that I have presented the facts in regard to the turnip growing contests in Nova Scotia.

QUEBEC

GRADING OF AGRICULTURAL PRODUCTS

BY AUG. TRUDEL, MANAGER, CHEESEMAKERS' CO-OPERATIVE AGRICULTURAL ASSOCIATION

THE adoption of a uniform system of grading for agricultural products has again been discussed at the annual convention of the Canadian Produce Association, held at Belleville on the 8th and 9th of February, 1916. Experiments made by a number of creameries in Alberta, Saskatchewan and Manitoba, which have sold a certain quantity of graded butter, were mentioned in this connection.

This system of grading and selling,

according to quality, which apparently is still in its initial stages in the western provinces, and is practically unknown in Ontario, was inaugurated six years ago by the Quebec Cheesemakers' Co-Operative Agricultural Association, with the help of the Provincial Department of Agriculture.

The attached table shows the work accomplished in this connection during the last six years and the very satisfactory results obtained:

QUEBEC CHEESEMAKERS' CO-OPERATIVE AGRICULTURAL ASSOCIATION

TOTAL OF THE VARIOUS GRADES OF PRODUCTS SOLD SINCE THE ASSOCIATION WAS ORGANIZED

	No. 1	No. 2	No. 3	Pasteurized	Total	Total Value
1910: Cheese	20,746 boxes	14,610 boxes	4,279 boxes		38,635 boxes	\$361,938 00
1911: Cheese	19,779 "	36,499 "	22,519 "		78,797 "	1,001,750 88
Butter	6,989 "	6,251 "	617 "	327 boxes	14,184 "	
1912: Cheese	23,976 "	39,026 "	26,486 "		89,488 "	1,358,026 11
Butter	13,053 "	9,316 "	1,883 "	2,785 "	27,037 "	
1913: Cheese	23,436 "	35,276 "	17,933 "		76,645 "	1,351,412 68
Butter	19,250 "	13,478 "	1,076 "	5,806 "	39,610 "	
1914: Cheese	32,064 "	43,052 "	23,015 "		98,131 "	1,702,580 37
Butter	24,277 "	8,659 "		6,742 "	39,678 "	
Fresh eggs	253 boxes (30 doz.)	129 boxes (30 doz.)	No. 1		382 "	2,077,564 96
Poultry	9,873 lb.	6,186 lb.	5,574 lb.		21,633 lb.	
1915: Cheese	42,400 boxes	43,139 boxes	22,440 boxes		107,979 boxes	
Butter	27,882 "	9,241 "	1,125 "	9,321 "	47,570 "	
Fresh eggs	1,623 boxes (30 doz.)	830 boxes (30 doz.)			2,453 "	
Poultry	18,230 lb.	24,829 lb.	19,518 lb.		62,577 lb.	
Maple syrup	261 gals.	1,479 gals.	501 gals.		2,241 gals.	
Maple sugar	798 lb.	9,699 lb.	2,673 lb.		13,169 lb.	

TOTAL QUANTITY OF BUTTER AND CHEESE, 1910-1915

	No. 1	No. 2	No. 3	Pasteurized	Grand Total
Cheese	162,401 boxes	211,602 boxes	116,672 boxes		490,675 boxes
Butter	91,452 "	46,945 "	4,701 "	24,981 boxes	168,079 "

TOTAL VALUE OF TRANSACTIONS, 1910-1915: \$7,853,272.90

The grading is done at the warehouses of the Quebec Cheesemakers' Co-Operative Agricultural Association by experts appointed by the Provincial Department of Agri-

culture. The defects of each product are carefully noted on a grading certificate, which is forwarded to the producer. A copy of this certificate is also sent to the purchaser. The

grader makes suggestions in order to help the producer to improve the quality of his goods; after the products are graded they are sold by auction and the total proceeds are handed to the producer.

The value of this system has been abundantly proved during the six years that it has been in practical operation in the province of Quebec; it may be safely asserted that it is

the only way to secure choice agricultural products. This fact is being well realized by farmers of the province, as proved by the ever-increasing quantity of products sold every year through the co-operative association. It is to be hoped that this system of grading and selling will be generally adopted throughout the country for the great benefit of the agricultural community.

NOTES FROM DISTRICT REPRESENTATIVES

BAGOT AND DRUMMOND COUNTIES

R. A. Rousseau, B.S.A.:—

"Several exhibitions of seed grain were held in my district. Considerable improvement was noted in the quality of the exhibits. The grain is better cleaned and selection is more generally practiced.

"The series of lectures given in the various parishes of my district will do a great deal of good, judging by the number of farmers who attended. The best evidence of the fact that farmers are greatly interested in these lectures is the considerable number of questions that were asked.

"One of our co-operative associations has just purchased a car of feed for live stock. There is a great reduction in price by purchasing in co-operation, and the farmers are beginning to realize this.

"Co-operation is making great progress among the farmers. I have just organized a farmer's club in a new parish of my district. I am convinced that farmers, once organized, will find it very profitable to sell their products and buy their supplies through the co-operative counter house in Montreal and the Quebec Cheese Makers' Co-operative Association."

DORCHESTER AND BELLECHASSE COUNTIES

Abel Raymond, B.S.A.:—

"At the last annual and general meeting of one of our co-operative associations, all the members were present and all were satisfied with the profits, although there was a strong competition to meet from the trade. The co-operative associations do better work wherever there are co-operative banks; it is easier for them to borrow the money required for their business.

"The work of the District Representative is keenly appreciated by progressive

farmers. The representative is urged repeatedly to repeat or continue the same demonstrations or experiments. The climate is not very suitable for the growing of ensilage corn in Dorchester and Bellechasse. Field roots are preferred by farmers and the area planted in this crop increases yearly.

"The seed grain fairs held in February met with the greatest success. There were many exhibits of good quality. However, they would have been a little cleaner if better sieves had been used in the fanning mill. The lectures given at these fairs will certainly give good results, as they were listened to by the best farmers of the district. Some demonstrations of killing and packing fowls were also given.

"As a result of the lectures on the improvement of dairy herds and sheep breeding, farmers are going into breeding much more extensively than in the past, and they have better and larger herds.

"The selection and the cleaning of seed grain are also attracting more interest every day. The practical demonstrations given for the farmers who intended to exhibit their grain at the provincial show, were very successful. The farmers now intend to prepare their grain for general seeding this spring as well as they have done for the grain grown for show purposes."

CHAMPLAIN AND PORTNEUF COUNTIES

J. C. Magnan, B.S.A.:—

"The women's club of Champlain will have an experimental garden this spring, where the village girls will be able to grow vegetables and flowers.

"During a seed grain exhibition, several farmers have expressed a desire to have demonstrations on the use of the fanning mill.

"Two potato cellars were visited and

some tubers attacked by the powdery scab were found. Necessary instructions were given for the control of this disease.

"School gardens are already giving us a great deal of work. Pamphlets are being distributed and circulars prepared.

"The establishment of a work women's garden in the city of Three Rivers is being discussed."

ROUGEMONT AND ROUVILLE COUNTIES

M. Henri Cloutier, B.S.A.:

"Some farmers of Rougemont county have been doing winter dairying for the last two years with the best results. The average yield is \$100 per cow net profit. The representative attends the poultry fairs, the seed grain exhibitions, the meetings of co-operative associations, the meetings of agricultural associations. Everywhere he gives lectures, as required.

"The subjects that have been studied during the series of lectures given in the various parishes of my district are the following: Dairying industry, breeds, breeding animals, earliness in breeding, economical feeding by means of ensilage and roots, silo and its advantages, field crops, selection of seeds, treating seed with formalin, seeding time, fruit culture, pruning of trees, fertilizers, preparation and use of insecticides and fungicides. These lectures take, on an average, 1½ hours, after which I answer the questions asked by the farmers. Wherever they have expressed a desire for the same, I have also spoken on tobacco, strawberry and raspberry culture."

QUEBEC AND MONTMORENCY COUNTIES

M. Alph. Desilets, B.S.A.:

"I have visited the Women's Clubs to see what use they made of the material that was distributed to them by the Quebec Department of Agriculture. In Chicoutimi the flocks of pure-bred fowls, hatched from eggs supplied by the Poultry Division, are in a splendid condition in their cold houses, and most of the pullets have been laying since December. A few roosters, however, had their combs frozen. The experiment on wintering bees is very interesting. Four colonies are wintered in 'bee pits,' in the open air, protected, however, from the west winds and covered with snow. They are in excellent condition. The six other colonies are in a cellar where the temperature is maintained at 40 degrees F. Very few of these have died so far. This is the first winter that bees have been wintered in this part of the country and there are reasons to think that bee-

keeping has great chances of success in this part of the province and deserves to be encouraged. There are a number of good honey plants and wintering is easy. In co-operation with some bee keepers, the Women's Institute will do some artificial incubation early in the spring so as to have good fowls for the fall fair.

"The Roberval Club is organizing, with a view to continue its instruction work and give practical teaching in horticulture. A special club has been formed for the management and care of the co-operative club garden and for the establishment of private gardens, at the homes of each of the club members. Particular attention will be given this summer to the beautifying of the grounds in the city and in the country. A concert with lectures is now being organized under the auspices of the Women's Institute, with a view to making a little money to defray the expenses caused by the cultivation and care of the garden."

NICOLET AND MASKINONGE COUNTIES

J. M. Leclair, B.S.A.:

"Great improvement was observed in the quality of the seed grain which I have been called upon to judge in various parts of the province. There is a large number of clover seed exhibits, but farmers do not seem to have the necessary equipment to grade and clean such a small seed as clover. They will have to improve this equipment. The interest shown in these seed fairs is growing; the number of exhibitors is increasing as well as the number of farmers looking for information.

"The breeding of the bacon pig is discussed everywhere; the Yorkshire and Tamworth breeds are recommended.

"No opportunity is lost to impress the farmers with the new economic conditions resulting from the war. If Canada wants its share of this opportunity, the farmers must endeavour to get a maximum yield out of their farms. They must be ready to satisfy the demand for cured meats, canned foods, eggs, poultry, butter, and cheese, etc. The production must therefore be increased at a low cost. In order to do so, the farmers must grow the crops giving a large yield of nutritive and succulent food, such as beets, swedes and fodder crops. They must not expect to make any large profit by feeding their cattle with hay, straw and grain. In order to get a larger yield from the farm, the best way is to increase the seeded area by ploughing up old meadows and pastures. Field roots, vegetables and ensilage corn are the best crops.

"Fall ploughing is the best but if the ploughing cannot all be done in the fall there is still time to do it in the spring, but

some precautions must be taken so that the land will not get too dry before seeding.

"I am now making an investigation on the conditions of the pig raising industry in the province. I have observed that there are three classes of breeders. Some farmers breed very poor hogs, and the quantity is hardly sufficient to supply the needs of the locality. In other districts, there is practically no pure bred stock. The best pigs are those that have been crossed with the White Chester, and breeding is very limited. They are fed too long, and sold too fat, and too heavy. In other places the pigs, generally pure-bred or crossed, answer better the requirements of the markets. Some fine sows are crossed with Yorkshire boars and the pigs from these crosses are of a superior quality. Too few hogs are raised everywhere. They receive too much grain when they are young and not enough vegetables and grass. The sows are also sold too young, as farmers do not know the advantage of keeping a good sow several years."

Alph. Paquet, B.S.A.:—

"A number of requests for information on the construction of silos were received. Lately, I visited a farmer who wishes to build a silo inside his stable. This farmer has a very good stable; there is a cement floor and a manure platform under a lean-to shed. He does not lose any of the plant food contained in the manure, liquid or solid.

"Several orchards are being visited and demonstrations are given on winter pruning, the removal of egg bands of caterpillars, the scraping of old bark, which is a regular shelter for all sorts of insect pests. The competition is keener than ever among the grain exhibitors at the local fairs, generally held under the auspices of the agricultural society. This year's grain exhibits are better cleaned and better classed than last year's."

MANITOBA

FARM LABOUR SUPPLY

REALIZING the probability of a keen shortage of farm help during the coming spring and summer, the Manitoba Department of Agriculture and Immigration is making a strenuous effort, through its St. Paul agency, to induce the immigration of a large number of farm workers from the United States. A widely reaching publicity campaign is being carried on to secure the men, and it is hoped to direct them from the St. Paul headquarters to ultimate destinations in Manitoba.

In order that the Department officials at St. Paul may be able to distribute the men efficiently, the various branches of the Manitoba Grain Growers' Associations are being asked to meet and receive from individual farmers direct applications

for such help as they will require. The applications so signed are not in any sense to be regarded as binding the farmers to accept men sent them, but are gathered rather in order that the needs of the different parts of the country may be intimately known and met.

The Department, however, realizes that there are very many farmers who will not attend any gathering that may be held by the Grain Growers' Association or any other body taking up this question, and so it is appealing direct to the farmers through the press as well.

In order to assist the movement, the Canadian railways are offering a special rate to all such incoming farm workers from the International boundary line northward.

WILL MARKET WOOL CO-OPERATIVELY

THE Manitoba Department of Agriculture announces that it will again carry on co-operative wool marketing for the farmers of the province, and it is advising wool growers to be in no hurry to accept early bids that may come to them from private quarters. Last year the Government's co-operative wool sale was a decided success, and, judging by the present

very strong situation in the wool trade, it is believed that even better prices will likely be obtained this season. The whole project, together with many helpful hints in relation to wool handling, is set forth in Circular No. 33, which may be had free by writing a post card to the Publications Branch, Manitoba Department of Agriculture, Winnipeg.

THE HOME ECONOMICS' SOCIETIES

NO organization could desire more substantial evidence of its usefulness and place in the community life than that accorded during the year 1915 to the Home Economics' societies of Manitoba. During the year the number of societies and the membership more than doubled, and there were at the close of the year 68 societies with a membership of close to 3,500.

During the closing half of the year 1915 the organization of new associations was not pushed very strongly because in every community Red Cross and other patriotic bodies were at work, and it was deemed unwise to attempt to cover the ground too thickly. At the close of the war, however, the places occupied by these agencies should prove to be an excellent seed bed for new Home Economics' societies.

During the year the Extension Department of the Agricultural Col-

lege has been very liberal in the way of supplying demonstrators for courses in cookery, and this phase of work has been very popular. Also fully half of the societies have held short courses in dressmaking and millinery, these courses usually being of one week's duration, and the attendance ranging from 25 to 60. At these courses not only farmers' wives and daughters have attended, but also a large number of town women, and a very noticeable result has been an increased friendliness and improved community spirit. In some towns and villages the Home Economics' societies have extended their activities to the establishing of rest rooms and libraries, and in some cases school and civic betterment have also been achieved.

A short course in home economics will be given at Manitoba Agricultural College from April 10 to June 29.

"In order that victory may perch on our banners three classes of people must do their part: (1) The farmer; (2) the munitions manufacturer; (3) the soldier and sailor.

"In the forefront of these three stands the farmer, the man who feeds them all."

J. Lockie Wilson, Toronto.

SASKATCHEWAN

A POTATO PLANTER

THE following description and illustration of the home-made potato planter devised at the College of Agriculture, Saskatoon, has been furnished to THE AGRICULTURAL GAZETTE by J. Bracken, B.S.A., Professor of Field Husbandry:

We planted 8 or 9 acres with this machine last spring, and the appearance of the crop was in every way satisfactory. It saved us the time

inch plough following the two-furrow 12-inch gang. Under more moist conditions, where the rows are planted rather closer together, it would not be necessary to use a single plough following the gang. After planting the crop we packed the land and harrowed it well.

The illustration will make quite clear the design of the attachments. The galvanized iron spout is wired to the frame of the plough, and at



A HOME-MADE POTATO PLANTER USED ON THE UNIVERSITY OF SASKATCHEWAN FARM

of three men during the length of time we were at work. We think it practical for any farmer having more than a small patch and, of course, the outlay in expenditure is very small.

A driver and a planter can plant as large an area as six horses can plough, walking at an average speed. In this particular case we put the rows of potatoes 3 feet apart, this necessitated the use of a single 12-

its bottom end to the iron framework back of the mould board. The hopper which is simply bolted to the stem of the seat, after removal of the latter, is strengthened by a small brace running from the hopper to the plough frame. The lower part of the front of the hopper is open so that the potatoes are always handy to the operator and immediately above the spout which conveys them to the furrow bottom.

CO-OPERATIVE MARKETING AND SHIPPING

CO-OPERATIVE wool marketing met with such success last year that the provincial department of agriculture is making vigorous efforts to extend the system this year. Circular letters have been sent to sheep owners giving details of the plan, and arrangements have been made to have officials of the Federal Department of Animal Husbandry do the grading.

Co-operative poultry marketing has also proved most successful. While good prices were obtained, better would have been had but for the impatience of shippers. No. 1 chicken brought 16.65 cents per lb., No. 2, 13.15 cents; No. 3, 8.75 cents. No. 1 fowl brought 13.65 cents per lb.; No. 2, 11.56 cents; No. 3, 3.75 cents. No. 1 duck brought 15.05 cents per lb.; No. 2, 13.45 cents; No. 3, 6.75 cents. No. 1 turkey brought 21.25 cents; No. 2, 16.75 cents; No. 3, 10 cents. No. 1 goose brought 14.75 cents per lb. These prices were after all expenses of killing, packing, handling storage and insurance had been met.

In accordance with the announcement made by the Co-operative Organization Branch that a man would be sent to aid any association making co-operative shipments of live stock, especially as regards the settlement of accounts during the month of January, four of six associations that took up live stock shipping were assisted. Each of these sent a carload of cattle or hogs. Choice hogs sold in Winnipeg at \$9 to \$9.10 per hundred, while drovers in Saskatchewan offered only \$7.50 to \$8.00.

LIVE STOCK DISTRIBUTION

Since the Live Stock Purchase and Sales' Act came into force in 1913, the following pure bred cattle have been distributed:

BULLS	1913	1914	1915
Red Polled.....			1
Shorthorn.....	3	23	59
Holstein.....	12	8	4
Hereford.....		6	8
Ayrshire.....	4	2	2
Angus.....		2	3
Cows			
Shorthorn.....	3	10	1
Holstein.....	12	1	3
Ayrshire.....	3	1	
Angus.....		2	7
Jersey.....			1

THE GRADE FEMALES SUPPLIED HAVE BEEN AS FOLLOWS

Shorthorn.....	27	229	240
Holstein.....	289	196	98
Hereford.....			18
Ayrshire.....	29	57	12
Total No. of pure bred bulls supplied			137
“ “ “ cows			44
“ “ “ grade females			1196

Total number of cattle supplied.....1377

The total number of sheep supplied in the three years was 3,649, of which 3,602 were grade ewes. Only seven swine were sent out.

FARM LABOUR

Owing to the number of enlistments a serious shortage in farm labour is anticipated. Even at this season wages as high as were paid last summer are being offered. It is expected that 3,000 of the 5,000 men now in the lumber camps will be available and agents are busy in the Western States trying to attract farm labourers to this province. The Bureau of Labour will look after any men coming here.

GOPHER SUPPRESSION

An active campaign is being carried on for the extermination of gophers. The appointment of a "gopher day" has been suggested by the Department, when everybody would unite for destruction of this little nuisance.

PART III

Rural Science

SCHOOL GARDEN PLANS FOR 1916

PRINCE EDWARD ISLAND

THE Department of Education of Prince Edward Island is continuing in 1916 to grant bonuses to public school teachers for special efforts in giving instruction in nature study and elementary agriculture. The special grants are paid for teaching rural science and not merely for conducting a school garden or inducing the pupil to carry out home projects. The work is expected to have a regular place on the school time table throughout the year. The gardening carried on by the pupil may be at school or home, or the projects carried out by them with farm crops or farm animals, or in domestic activities shall be considered largely as a practical basis for school room instruction.

The bonus will be paid twice a year namely: at mid-summer and at the close of the year. Teachers are required to send a written report as a part of their half-yearly returns to the Department of Education showing what work has been taken up throughout the preceeding half year. These reports will be examined by the inspectors and endorsed for payment of the grant. For this work \$2500 is allotted from the funds com-

ing to the province from the Dominion Government under the terms of THE AGRICULTURAL INSTRUCTION ACT.

SCHEDULE OF GRANTS

To be eligible for grants the following requirements must be fulfilled: (1) Systematic instruction in rural science in the school every week throughout the term; (2) A written report on the provided form to the Department of Education at the close of the term showing the instruction that has been given; (3) Pupils' records of the work systematically kept in special rural science note books; (4) (a) Supervised projects or gardens at the pupils' homes or (b) a well kept school garden, in which there are some valuable demonstrations and experiments with vegetables or field crops or both, as well as attractive flower beds and borders.

A school garden neglected in the summer holidays will disqualify for part or all of the bonus. While it is not made one of the requirements, teachers are encouraged to arrange for a school fair in September or October.

THE GRANTS

	For the first half-year	For the second half-year
Class I.—To teachers specially trained in two sessions of the Summer School	\$7.00	\$5.00
Class II.—To teachers specially trained in one session of the Summer School	\$6.00	\$4.00
Class III.—To teachers who have not attended Summer School, but who are doing creditable work	\$5.00	\$3.00

NOVA SCOTIA

L. A. DEWOLFE, B.A., DIRECTOR OF RURAL SCIENCE SCHOOLS

WE are trying to modify our definition of a school garden. Instead of a formal plot of definite size, laid out checker-board fashion, we prefer to include informal flower borders. The prevailing notion is that a garden must be ploughed. Where grounds are too rocky to be ploughed, therefore, the teacher feels justified in saying a school garden is impossible.

One of the formal type is impossible, but the informal flower clumps can be planted anywhere—among the rocks, along the fence, against the school house, and after all, the educational value of growing flowers under these conditions is fully as great as is that of the best kept garden in the country. Vegetables, in such rocky communities, will be grown at home.

The Monthly Rural Science Bulletin will contain specific instructions on the selection of flowers and vegetables. Our rural science teachers possess experimental farm reports and bulletins, as well as one or two good garden books, which give instruction on preparing the soil and planting the seeds.

This spring, for the first time, we shall hold local Rural Science teachers' institutes. Where fifteen or twenty such teachers are within easy travelling distance of some central point, we shall bring them together for two days to discuss their specific gardening problems. The government will credit these as

teaching days. The County Inspector will, where possible, meet with us at these institutes.

The supplying of seeds is left to the teacher's initiative. In some cases, the children bring ten cents each from home. In others, a concert or social is held. Children often save seeds from their last year's garden. Where the teacher lacks the necessary leadership, the Rural Science Department, as a last resort, will donate the seeds. Seed potatoes and grain are furnished in small quantities by the Dominion Experimental Farm at Nappan.

We try to include Arbor Day in the gardening programmes. Instead of planting a lone tree in a place where it is not needed, we want to plant native shrubbery against the buildings and along the fences. Such shrubbery, well massed, makes an excellent background for flowers.

In the past, local prizes have been offered for home gardens but nothing has been given for school gardens. This year, however, prizes will be given for the latter.

Furthermore, our School Law permits a garden grant to trustees from the County Fund. This is small—\$20 for one-eighth acre. The recommendation of such grant rests with the inspectors. This year, some of our inspectors will modify their recommendations to reach the small garden. They will recommend on a basis of \$5 for each 1,250 square feet—up to one-eighth acre.

ONTARIO

BY J. B. DANDENO, INSPECTOR OF ELEMENTARY AGRICULTURAL CLASSES

WE aim in Ontario to have a school garden in each rural school as part of the regular equipment. It will take, of course, several years to attain this result. The Education Department encourages school gardens by special grants to both teachers and trustees. Urban schools as well as rural schools are encouraged by similar grants.

The school fairs now in charge of the District Representatives of the Department of Agriculture are at present supported largely by the home garden project, but it is intended as soon as practicable to have the school garden contribute quite largely towards the material of the school fair.

To a teacher who has a certificate in agriculture, and who carries on a school garden according to the regulations, the Department of Education will pay \$40, and to the trustees \$30 annually. This sum to the trustees must be spent in equipment for the classes in agriculture.

It must be kept in mind that the school garden is an educational institution and that it is intended to be a sort of laboratory for school work. In addition to this it is the intention to urge, as far as possible,

the farmers of the neighbourhood to take part in the work of the garden by using it, to a limited extent, for experimental plots. When this phase of the work comes to be well established the care during summer is insured.

The chief difficulty in most cases is the lack of sufficient land for both play-grounds and plots. In this connection it is urged that trustees secure additional land not only for school plots, but also for play-grounds to be made into tennis courts or ball grounds as may be decided upon. In this way the social side of the rural problem becomes, in part at least, capable of solution.

Except for the very youngest pupils in the school the plots should aim to answer some questions, and not to be merely a ground upon which to grow something. For problems to work out in the plots the farmers should be consulted and they should be encouraged to co-operate with the teacher. In this way the rural school becomes to a certain extent an agricultural school where the three R's and agriculture compose the Big 4 of the system.

MANITOBA

BY H. W. WATSON, M.A., DIRECTOR OF ELEMENTARY AGRICULTURAL EDUCATION

OUR plans for this year are very similar to those of last year.

We will distribute free on application, wind-break seedlings, packets of wheat, oats, barley, corn, alfalfa and potatoes for school plots. We will also furnish vegetable and flower seeds at 2 cents per packet, perennial flower roots at 5 cents each, shrubs and shade trees at 5 to 10 cents each, according to size and variety.

The Jehu corn competition for the province will be conducted again this year, and some preference will be shown to exhibits produced from home-grown selected seed.

From May 1st until the end of June, I shall spend the entire time among the schools in laying out grounds or garden plots, and in offering suggestions to the teachers and pupils on planting, cultivation, etc.

Many school boards are encouraging the work by offering prizes for garden plots and exhibits at the School Fair.

In order to grade the work and

make it more educational, I am advising that not more than two varieties of vegetables, grains or flowers be grown by a single pupil, according to the following outline:

GRADES I TO III

VEGETABLES

Radish
Beans
Peas
Beets after radish
Turnips

FLOWERS

Nasturtium
Poppy
Candytuft

GRADES IV TO VI

Onions
Carrots
Parsnips
Potatoes
Corn

Marigold
Calliopsis
California Poppy
Mignonette
Perennials

Wheat, one variety
Oats, one variety
Barley, one variety

GRADES VII TO IX

Cucumber
Cabbage, transplanted
Tomatoes, transplanted
Potatoes, experiments

Sweet Peas
Morning Glory
Aster, transplanted
Stocks, transplanted
Gaillardia
Perennials
House plants

Wheat, three varieties
Oats, three varieties
Barley, three varieties
Alfalfa, two varieties
Corn, two varieties
Grasses

TREES

Ash
Elm
Maple
Lilac
Caragana
Honeysuckle
Snowball
Hawthorne
Wild Plum

SASKATCHEWAN

BY A. W. COCKS, B.Sc., DIRECTOR OF SCHOOL AGRICULTURE

AS far as the Department of Education and its officials are concerned the efforts being put forth to encourage school garden work in the province during 1916, have been indicated in articles contributed to THE AGRICULTURAL GAZETTE and published in the January and February numbers. Some further information respecting competitions at school fairs will be given under the heading "School Fairs in Saskatchewan, 1916". Therefore it will be necessary now only to give a summary of what has been already published:

The Directors of School Agriculture give instruction in nature study, agriculture and school gardening in the Normal Schools at Regina and Saskatoon, and to the third

class normal sessions which are held at various centres in the province during the months of January, February and March. Short courses for public school and high school teachers will be held at the university in July and August. At these courses the directors will have the assistance of the members of the staff of the Agricultural College, Saskatoon, and the courses will be open only to teachers of the province.

Planting material is not being supplied free to school districts, but the Co-operative Branch of the Department of Agriculture has obtained a large supply of seeds of vegetables, flowers, grasses, cereals and trees, which will be sold for use by teachers and pupils at prices considerably lower than those usually charged.

Information respecting this is given in School Agriculture Circular No. 4: Seed Catalogue for School Gardens.

To encourage the beautification of school grounds the department has made arrangements with the Chief of the Tree Planting Division, Forestry Branch, Nursery Station, Indian Head, and with the Department of Public Works of the Provincial Government for the free distribution of trees and ornamental shrubs to school districts. These trees and shrubs are supplied only to those districts where the ground has been properly broken and cultivated. In most parts of the province a thorough summer-fallow in the year previous to tree planting is demanded.

After due consideration the department has decided to place the responsibility for the organization and conduct of school fairs, as much as possible, in the hands of the

teachers and other interested persons of the local communities. It has further been suggested that in each municipality or group of municipalities Rural Education Associations be organized, and that the organization of school fairs be carried on by a committee of the association. A circular outlining the objects and constitution of these associations has been published and will be followed at an early date by one on "School Fairs", the latter outlining the object of the school fair and containing suggestions for rules, prize-lists and prizes. In addition to the above the directors are preparing pamphlets on "The School Garden" and agricultural education generally, which will be of assistance to teachers, and they are arranging for many meetings with teachers, trustees and ratepayers throughout the province in order that enthusiasm and inspiration for the work may be created.

BRITISH COLUMBIA

BY J. W. GIBSON, M.A., DIRECTOR OF ELEMENTARY AGRICULTURAL EDUCATION

IN January circulars were sent out to the teachers and school boards of the province, giving instructions regarding the making of school garden plans and also regarding home gardens. Teachers were asked to discuss the establishing of school and home gardens with their respective school boards, and in all cases where the board decided in favour of the undertaking, the teacher, with the aid of his pupils, formulated a plan of the proposed garden. These plans gave full and accurate information with reference to (1) size of garden; (2) size and arrangement of plots and paths; (3) divisions or classes occupying the different parts of the garden; (4) plots to be used in vegetable growing; (5) plots or borders set apart for the growing of flowers, both annuals and perennials; (6)

class or community plots distinguished from individual plots; (7) large plots for agricultural experiments in field crops, root or fodder crops (for older boys only); (8) plots for growing seedling trees and shrubs or for the propagation of fruits by budding and grafting; (9) location of the garden with reference to fences, buildings, or streets (use arrows and number of feet only); (10) indication of direction by pointer or by marking the sides; (11) name of the school in upper left-hand corner; (12) name of the teacher in lower right-hand corner.

APPLICATIONS FOR GRANTS

The secretary of the school board then forwarded the garden plan or plans to the Director of Elementary Agricultural Education with a letter making application for such assist-

ance as the department offers. As the garden grants are not sent out until the end of the year, it is necessary for school boards to provide for the running expenses until reimbursed by the department. For this reason and also to insure that school boards become responsible, with the teachers, for the successful working out of the scheme, all business is transacted through the board.

Immediately on their arrival at the department, the plans are examined and accompanying letters from school boards and teachers considered. Each case is dealt with separately. The plan is approved and notice to this effect sent to the school board, or else suggested changes or amendments are indicated on it, and it is returned to the teacher with a request for an amended plan.

REGULATIONS AS TO SIZE

It was found necessary to require that those school gardens on which school boards and teachers receive grants be of a certain size. In order to receive the garden grant offered to school boards by the department, a one-room school having an average attendance of fifteen or over, or each room of a graded school, must have a garden not less than 2,500 square feet, inclusive of walks, borders, etc. (flower borders and plots are not necessarily confined to the garden itself, but may be located in other parts of the grounds for decorative purposes). In cases where the average attendance is less than fifteen, the required minimum area is 1,500 square feet. Most of the gardens are considerably larger than the required area.

EQUIPMENT

The teachers and school boards are held responsible for purchasing all garden seeds, fertilizers, tools, etc., and at the end of the year must furnish a certified statement in detail of all such expenditures. In no case does a school board re-

ceive more than has actually been expended in the work. A prescribed list or set of garden tools is furnished to each board as a guide in ordering. The cost of a proper set of garden tools will average about one dollar per pupil, i.e., a set of tools for a class of twenty-five gardeners will cost at least \$25.00. In the case of graded schools where several divisions are taking part, one set of tools is usually sufficient, as it can be arranged to have the pupils of one room at a time in the garden.

REPORTS REQUIRED

The teacher is asked to keep a brief summary of the work done, not only in school gardening but in all branches of nature study and rural science. Report forms are supplied which are to be filled out in duplicate by each teacher who conducts the work; one copy is kept in the school-room and the other sent to the public school inspector, who endorses it and forwards it to the director. A teacher is permitted to carry on school gardening only with his or her own pupils. In this province, where teachers change schools so frequently, the plan of sending semi-annual reports has been adopted. Bonus grants to teachers are based upon these reports and also upon the inspector's private report and scoring of the garden.

THE GRANTS

As the expenditures in connection with first year gardens are greater than in subsequent years, the initial grants are larger than the regular maintenance grants which follow. Initial or first-year grants to school boards are as follows:—

- (1) Ungraded school, average attendance less than 15. \$30.00
 - (2) Ungraded school, average attendance 15, or over. 50.00
 - (3) For each additional room in a graded school taking school gardening. 10.00
- (For example, if three rooms in a graded school establish gardens each

of which must be at least 2,500 square feet in area, the grant to the board is \$70.00 for the first year.)

The subsequent annual maintenance grants are as follows:—

- (1) Ungraded school, average attendance less than 15. \$20.00
- (2) Ungraded school, average attendance 15, or over. 30.00
- (3) The sum of nine dollars is added for each additional room in a graded school taking up gardening after the first year. If the work has not been carried on in a satisfactory manner throughout the season, these grants are reduced according to the inspector's scoring.

Teachers' bonus grants are as follows:

- (1) To teachers holding a rural science diploma (granted to teachers on two years' attendance at rural science summer schools), the annual bonus grant is \$30.00.
- (2) To teachers holding the interim certificate in rural science (one year's attendance at rural science summer school) \$20.00.
- (3) To teachers without special qualifications who carry on the work successfully throughout the year \$10.00.

Teachers in (1) and (2) who carry on the work from January until June receive three-fifths of the yearly grant, and those who carry it on from August to December, two-fifths.

Teachers who conduct home gardening in accordance with the regulations of the department receive the same bonus grants as if conducting school gardening at the school.

When a school's exhibition is held in connection with the home gardening work, school boards receive the same grant as for the maintenance of school gardens subsequent to the first year, and they are allowed to expend up to one-half of that amount in purchasing suitable prizes for the exhibitors at the school fair.

Emphasis is placed throughout, in both school and home gardening, on the educational use of the garden and not upon the produce obtained from the plots in the garden.

The cheapest way to get an unprogressive region into the swim of progress is to furnish it with good roads. It is equally the best way to get an unprosperous group of people into the list of people with bank accounts. This isn't a theory of mine—the surveys show it.

—*Herbert Quick in the Country Gentleman.*

THE CONSOLIDATION OF RURAL SCHOOLS

THE consolidation of rural schools has been the subject of much interest on this continent for a number of years. It has made progress on both sides of the international boundary. In the June and July numbers of THE AGRICULTURAL GAZETTE for 1914 occasion was taken to set forth the progress in consolidation that had been made in several of the provinces of Canada up to that time. Since then some further advance has been achieved, as is shown by provincial educationists in the following articles. The situation as it exists in several of the United States with respect to this subject, taken from official documents, is also presented:

NEW BRUNSWICK

IN a letter to THE AGRICULTURAL GAZETTE regarding School Consolidation, R. P. Steeves, M.A., Director of Elementary Agricultural Education, states that his article as published in Volume 1, July, 1914, page 563, still describes conditions in the province of New Brunswick.

During 1915 one consolidated school district was added to the list of consolidated schools, namely, Rothesay, in King's County. This includes the village of Rothesay, which is suburban to St. John, and two country districts, Gondola Point and Forrester's Cove.

MANITOBA

BY H. W. WATSON, M.A., DIRECTOR OF ELEMENTARY AGRICULTURE

CONSIDERING the financial stringency of the past year and the consequent difficulty in obtaining money for the building of new schools, consolidation has been making very satisfactory progress. At the beginning of last year there were fifty-eight in operation, and ten more have been organized since. A few extracts from the annual reports of a number of the school inspectors of the province as well as evidence gathered from executive officers of various trustee boards will give an idea of the advantages of consolidation and the increase of interest in favor of the movement.

In the general annual report of the Deputy Minister and Superintendent we find the following statement:

"The movement toward consolida-

tion is steadily making way. Whenever the plan has been put into intelligent operation the results have been good."

REPORTS OF SCHOOL INSPECTORS

"Throughout the province enough consolidations have been established to demonstrate the great superiority of the system.

"F. H. BELTON,

"I. P. S., Roblin."

"The number of consolidated schools in operation increased from two to nine during the past year. These schools continue to do excellent work, and the foresight of the Department in encouraging consolidation has been amply indicated. The efficiency of the graded school over the ungraded one is everywhere acknowledged, which is a strong argument in favour of consolidation as a solution of the problem of rural education.

"J. BOYD MORRISON,

"I. P. S., Hamiota."

"The completion of the organization of the newly formed Kenton and Lenore Consolidated districts took place during the year, and these districts have been operating most successfully.

"A. J. HATCHER,
"I. P. S., Elkhorn."

"There are three consolidated schools in this district fully sustaining the objects for which they were organized and giving general satisfaction. These schools give better educational facilities and, although in one or two cases the cost may be slightly higher than that of the one-roomed rural school displaced, yet much greater value is received for the money expended.

"GEO. HUNTER,
"I. P. S., Deloraine."

district, and has a very satisfactory report to offer.

"J. E. S. DUNLOP,
"I. P. S., Brandon."

"Much interest is manifest in the bettering of educational facilities among the rural districts. This is shown by the constant appeal for information regarding consolidation problems. They are in every way the most successful schools in the inspectorate and their efficiency is every where increasing. At the recent entrance examinations twenty-one rural schools sent up forty candidates, 65 per cent passed but not one took honours; while from the consolidated schools 100 per cent passed and 30 per cent took honours.

"W. C. HARTLEY,
"I. P. S., Carman."



THE CONSOLIDATED SCHOOL, HAMIOTA, MANITOBA

"Consolidation has been a much discussed question during the past year. In spite of failures to establish consolidated districts, I am of the opinion that the consolidated school is growing in favour.

"D. J. WRIGHT,
"I. P. S., Brandon."

"The principal of consolidation is gaining wider favour each year.

"A. A. HERRIOTT,
"I. P. S., Gladstone."

"The policy of consolidation is steadily growing in favour. Stockton has completed its first year as a consolidated school

"The two consolidated schools at Dominion City and Greenridge continue to do excellent work. The attendance is very large and in both cases more teachers and new buildings are required. Work for second-class certificates is taken up in both schools. The latter school is two-roomed and is entirely rural.

"M. HALL-JONES,
"I. P. S., Winnipeg."

"Consolidation is a much discussed subject in some localities of this division.

"E. D. PARKER,
"I. P. S., Winnipeg."

STATEMENTS OF SCHOOL TRUSTEES
REGARDING CONSOLIDATION

"The attendance of van children is better than that of those from the village.

"W. C. MCKINNELL,
"Teulon."

"Our consolidated school still continues to give universal success. It will continue to expand as circumstances may require.

"ROBT. HOUSTON,
"Starbuck."

"Advantages of consolidation are:—
Regular and punctual attendance, increased opportunity for rural children. The total cost is slightly more but the cost per pupil is only about two-thirds what it was formerly.

"R. A. FINES,
"Darlingford."

the discarded system, when they had to get their children to school the best way they could.

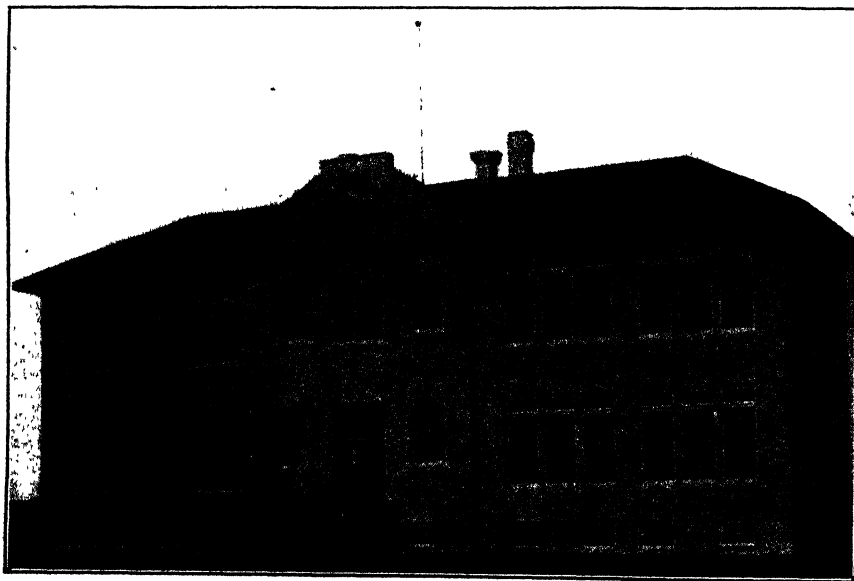
"GILBERT ROWAN,
"Miniota."

"Our vans have never missed a trip since starting two years ago and are always punctual.

"B. G. DOAK,
"Warren."

SUMMARY OF THE CHIEF ADVANTAGES OF
CONSOLIDATION

1. Increased and regular attendance.
2. Punctuality.
3. Truancy is unknown.
4. Better teachers are secured with longer tenure of service.
5. It is frequently possible to obtain a married man as principal.



THE NEW CONSOLIDATED SCHOOL, STRATHCLAIR, MANITOBA

• "Advantages of consolidation are:—
Better means of getting to school, better moral conditions, better schools, graded rooms, and wider courses.

"CHAS. BYRDON,
"Roblin."

"We conclude that consolidation has created ideal conditions to meet the educational requirements of our community."

"F. M. SMITH,
"Kelwood."

"Those who have their children drawn o school would not think of returning to

6. A graded system is rendered possible.
7. The older children remain longer in school.
8. The children enjoy greater comfort.
9. The cost per pupil educated is greatly reduced.
10. The school is supervised by an experienced principal.
11. The visits of the inspector are more valuable and effective.
12. A wider and fuller course of study is possible.
13. Consolidation is the best method of providing the children of the farm with high school privileges.

SASKATCHEWAN

CONDENSED FROM REPORT OF A. W. COCKS, B.Sc., DIRECTOR OF SCHOOL AGRICULTURE

SCHOOL consolidation in the West has made its greatest progress in Manitoba, but in Saskatchewan also, as well as in Alberta, considerable advancement has been made. Until 1913 no provision was made in The School Act of this province for the formation regularly of a district with an area of more than twenty square miles, but in that year an amendment was made to the Act which allowed the organisation of a school district of not less than thirty-six square miles nor more than fifty square miles in area. Another amendment provided that the boundaries of any school district might be altered by permission of the Minister so that they should include an area of not more than fifty square miles. At the same time a section was introduced into the Act which made it the duty of the board of every district formed under either of the above amendments to provide for the expenses of the conveyance to and from school once a day each way of all pupils whose residence for the purpose of attending such school was distant therefrom more than one and one-half miles as measured by the nearest allowance.

By these amendments to the Act a way was made for the organisation of large districts or for the consolidation of two or more smaller districts. Previous to 1913 there existed in The School Act a section which allowed the board of any rural district to enter into an agreement with any other board or boards for the

education of the children of its district. The trustees in this case were given full power and authority to obtain funds under the provisions of the School Assessment Act for the purpose of carrying out the terms of the agreement and for providing for the conveyance of the children to and from school. In several cases where the small number of children in a district has made it advisable to operate a school therein advantage has been taken of this section to the general satisfaction of all concerned, and in many instances the trustees have found this method of providing education for the children of their district more economical than either operating a school or proceeding to consolidation. To assist districts providing conveyance for the pupils in accordance with the regulations of the department, in the case of large districts, or, when the pupils are being conveyed to another district, The School Grants' Act provides for a grant not to exceed one-third of the actual cost of conveyance.

During the years 1913 and 1914 eleven districts were organised by taking advantage of the amendments providing for the organization of large districts. Of these nine are still in operation as large districts, while two, owing to the difficulties and expense of conveyance, have reverted to their original status. The details of organization and operation of the districts still in existence as large districts are given in the following table:

PARTICULARS OF OPERATION

DISTRICT	No.	Area	Children of School Age in District, April, 1915	Children Enrolled, April, 1915	No. of Days in Operation, 1915	No. of Teachers Employed, 1915	Salaries	Children Conveyed	No. of Vans	Length of Van Routes in Miles	Amount Paid Van-drivers per Day	Rate of Taxation	Average Attendance, March, 1915
Trossachs	1077	38 ¹ / ₂ secrs.	64	61	191	2	\$ 900	25	2	8 & 5 ¹ / ₂	\$ 3 00	Mills 6	Per Cent 90
Minor Lake	1077	43 "	8	8	143	1	780	6				6	97
Hughton	2496	50 "	25	17	209	1	720					3	5
D'Arcy	3016	49 ¹ / ₂ "	47	37	120	1	840	20	2	Average 7	3 50	9	84
Flaxcombe	488	50 "	45	45	210	2	600 900	29	3	Average 7	& \$4 2 30	10	89
Cupar	972	50 "	110	101	189	3	1,200 800	46	4	9, 12, 13, 10	3 50	8	91
Aneroid	2704	50 "	80	78	207	2	720 1,050 780	53	3	Average 7 ¹ / ₂	2,700 per year 3 routes		
Lemsford	2856	49 ¹ / ₂ "	30		120a	1	800					12	91
Portreeve	3028	45 "	35	33	197	1	960	21	2	Average 4 ¹ / ₂	3 50	5	88

Higher work is being attempted than was possible in the original rural school. Many of the large districts possess from three to six acres of land which is used for instruction in nature study, agriculture and school garden. In organizing, some difficulties have had to be surmounted, owing to the increased taxation that was necessary and to the greater distance that had to be travelled by the children. These obstacles are responsible for the reversion of two districts back to their old-time status. Owing to the sparsely settled condition of the country the van routes are longer, and the planning of the routes to the satisfaction of all is somewhat difficult. Competent drivers are also sometimes hard to en-

gage. The safest and most practical type of van appears to be a democrat gear with a home-made top, costing about \$150. In winter the vans are heated by oil stoves or foot warmers, and heavy robes are provided. The wages paid to the drivers vary from \$2.50 to \$4.00 a day, according to the length of the route. The rate of taxation varies from 5 to 9 mills on the dollar, or from 13 to 30 dollars a quarter section. Because of the difference in the methods of assessment in villages and rural districts, it is difficult to make comparisons on this basis. However, wherever consolidation has had a fair start in Saskatchewan, it can reasonably be said that the results have been satisfactory.

BRITISH COLUMBIA

SCHOOL consolidation has made a beginning in the province of British Columbia. In *The Farmers' Magazine* for January, Colin W. Lees shows some of the advantages of consolidation taken from the experience of a consolidated school at Summerland, in the Okanagan Valley:

"Of the four teachers in the Central School, one is a university graduate and holder of an academic

certificate, the highest granted in the province; two hold first-class, certificates and one a third-class. The total amount paid yearly in salaries to the four teachers is \$4,380 and the average teaching experience is between twelve and fourteen years. Not only so, but each one brings to the work of his or her particular grade, special ability and training, which is impossible in an ungraded school, where the teacher

must of necessity be a jack-of-all-trades. In a word, each is as capable and as well trained as the profession provides, and, as a result, the teaching is just as efficient as any in the province, not even city schools excepted.

"Furthermore, among the pupils there has developed a splendid school spirit and community interest, resulting from the playing of games calling for team work and individual sacrifice for the sake of the whole."

PROGRESS OF CONSOLIDATION IN THE UNITED STATES

IN a number of states of the Union to the South there has, of recent years, been much activity in consolidating one-teacher rural schools into single central schools, to which the children in frequent instances are transported at public expense. From a report of the Commissioner of Education, it is ascertained that in 1913 in nearly one-third of the states, bulletins had been issued giving information for those working for consolidation. States, it is stated, whose schools are organized on the county basis, or the township basis, are consolidating much more rapidly than those upon the district basis. Louisiana, for a long time a state little given to the adoption of modern ideas, stands at the head of consolidation, or, at least, did two years ago. Tennessee also shows noteworthy progress, 150 small schools in one year being transformed into 50 larger units. Mississippi organized 75 consolidated schools during a year, the children attending which were transported at public expense. In three years, 175 consolidated schools were established, necessitating the use of 240 wagons. In Box, Elder county, in the state of Utah, 11 new school buildings were erected in twelve months in lieu of 30 old buildings, at a cost of \$205,000.

THE MINNESOTA PLAN

In the states mentioned in the foregoing paragraph the schools were all conducted on the county or township basis or parish basis, as in Louisiana. In states where the single district plan is adopted, the progress in consolidation has not been so marked. Colorado, for instance, only had six consolidations in

the year. In Minnesota, however, due to aid derived from a measure known as the Holmberg Act, whereby a petition signed by 25 per cent of the freeholders brings the district into consolidation, generous assistance from the State, is provided when the consolidated school meets with the approval of the State Department of Education. Schools in the consolidated districts are classified as, A, B and C. Each must maintain a session of eight months, and must have suitable buildings and equipment. Class A must have four departments, Class B, three, and Class C, two. The principals are required to have a knowledge of agriculture besides diplomas or first-grade certificates. A schools receive \$1,500 annually from the State; B schools, \$1,000, and C schools, \$750. In addition the schools receive 25 per cent of the cost of construction of the required building up to \$1,500. As a result of this Act in less than two years 39 districts replaced 120.

MISSOURI FOLLOWS SUIT

Missouri adopted the Minnesota plan with corresponding success, and Iowa did the same in a partial way. In Missouri the consolidated school must occupy a site of at least five acres, and must possess a school building with a general assembly room that can be used for public meetings. The State pays a fourth of the cost of the building up to \$2,000, and also pays \$25 annually towards the maintenance of the school for each square mile in the consolidated district, providing that, at least, a third-grade high school giving one year's work in agriculture is maintained.

PART IV

Special Contributions, Reports of Agricultural Organizations, Notes and Publications

THE COST OF LIVING

The Commission consisting of John McDougald, Commissioner of Customs, C. C. James, Commissioner of Agriculture, J. U. Vincent, Deputy Minister of Inland Revenue, and R. H. Coats, Chief Statistician of the Department of Labour, appointed December 20th, 1913, to investigate the cost of living, have embodied their report in two volumes—one of 955 pages and the other of 1108 pages—and a supplement of 83 pages. The work was evidently done most thoroughly, for there is not a line of either fact or thought involved in the problem but was not gone into for a period covering the fourteen years prior to 1914, during which time there was a rapid rise in all the commodities and necessities of life. The increase in instances ran as high as 75 per cent, but from 30 per cent to 50 per cent about represents the average; while the tabular matter of which there is a vast quantity, is generally limited to 1913, and the 13 years preceding. The inquiry extended to August, 1914, when the outbreak of war disturbed the normal condition of things and checked the slump in prices which a short time previous appeared to have set in.

THE FIRST VOLUME

The early part of the first volume deals with the range of inquiry and the conclusions arrived at. The second section of the volume comprises 43 appendices covering 860 pages and embracing the evidence and opinions of many thoughtful men and experts in many walks of life. Special attention is paid to the needs of the masses—to the necessities of comfort and modest luxuries. Increase in the gold supply—the increase being from \$113,149,620 in 1890 to \$454,621,600 in 1910—which has reduced the purchasing power of money, the enormous expenditure on railways and public works, and large investments in non-productive lines incident to the development of a young country, extravagance and wastage, both public and private, increased desire for luxuries, withdrawal of popula-

tion from the land to urban centres, monopolies, industrial combinations, mergers and trusts, and uneconomic methods of distribution, are among the chief causes given for the advance in cost and that have led to the demand for higher wages and increased rentals. A sententious but o'er true remark is that the "High cost of living is due to the cost of high living." Improvement is looked for through land settlement, greater attention to mixed farming, increased production, with standardization and improvement of quality in farm products, together with co-operation in their distribution. Another sententious remark that embodies the gospel of truth is "You cannot educate people and expect them to live under the old conditions."

The appendices, for which Mr. R. H. Coats is largely responsible, deal in the first 500 pages with prices, wholesale and retail, wages and rents. Then follow facts relating to cold storage, adulteration and inspection of food stuffs, weights and measures, waste by fire, cost of production, agricultural credits, public markets, co-operation, land settlement, taxation, etc., furnished by recognized authorities on the different subjects.

THE SECOND VOLUME

Volume II is largely statistical. After an explanatory introduction, it is divided into three parts. The first is entitled "Facts" and contains half a dozen sections, dealing respectively with the prices of commodities in this and other countries, the prices of services, rents from 1900 to 1913, wages, prices of securities and rates of interest and duration of loans. Part II comes under the head of "Causes" and consists of two sections, the first being devoted to monetary conditions and the other to general economic conditions in Canada from 1900 to 1913. Part III consists of the "Summary—The Rise in Cost of Living and its Economic Causes." Some remarks on fish and dairy products close the volume.

There is a section of the second volume that will be of popular interest, apart from the immense amount of well-prepared information that is furnished. This is a historical sketch of the rise in prices. Early in the sixteenth century a good fat ox could be had for eleven or twelve shillings. Late in the same century the price had increased to forty shillings for the best, an increase of more than 230 per cent. For purposes of comparison the following prices are quoted:—

PER LB. OF	1757	1772	1915
Beef	7c	11c	25c
Mutton	6c	12c	21c
Veal	6c	10c	18c
Pork	7c	11c	21c
Butter	16c	24c	35c
Cheese	7c	10c	20c

THE SUPPLEMENT

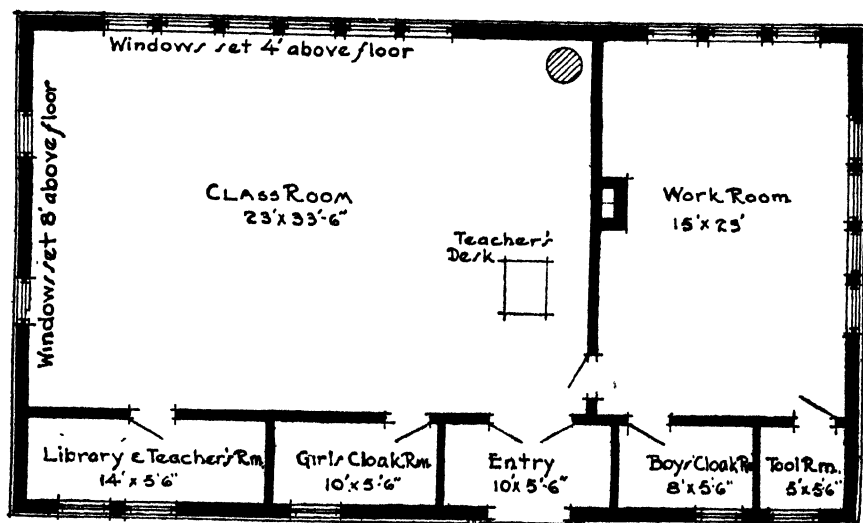
Part III of the second volume, for convenience sake, is repeated in the Supplement, which contains not only the "Findings" of the Commission but also a series

of between forty and fifty charts and diagrams, showing at a glance not alone the fluctuations of prices in Canada, but also in other countries for purpose of comparison. "The value of Canadian agricultural capital," it is said in this Summary, "increased according to the census 136.4 per cent between 1900 and 1910. Omitting land values the gain is only 118.6 per cent. On a quantitative basis, however, these estimates are markedly reduced. The acreage of improved lands has increased only 60.8 per cent. Equipment like implements and elevator capacity has increased faster, namely, 125 per cent and 450 per cent respectively, though farm buildings show only a 40 per cent increase. The real increase in agricultural capital may be set down at 63 per cent. The Western provinces, of course, have been the scene of practically the entire advance. In Saskatchewan, Alberta, and Manitoba, increases in improved acreage have been 957, 816, and 69 per cent respectively; Quebec standing next with only 9 per cent; Prince Edward Island with 5.9 per cent, and the other provinces stationary."

RURAL SCHOOL WORKROOMS

THE rural schoolhouse should be designed to accommodate and encourage many legitimate phases of school work now generally neglected in the country. All district schoolhouses, those for one-teacher schools as well as those of

the consolidated type, should have, at least, one work-room—two would be better—where manual training, domestic science, and related subjects could be taught according to laboratory methods. In a district where the number of school



—GROUND FLOOR PLAN OF A ONE-TEACHER SCHOOL

children does not exceed 30, one good-sized, well-lighted workroom can be made to accommodate both boys and girls by alternating their work. Here the boys can be taught to make useful articles of furniture for their homes or for the school, and to apply their arithmetic and drawing to real problems. Such work can not be done in the regular classroom. When a separate room is provided, much of the manual work can be done while the teacher is hearing other classes recite. The separate workroom will furnish an excellent opportunity to place a definite responsibility on pupils who work for a part of their time out of sight of the teacher, but near enough to call for direction whenever it is needed. Manual and domestic work is individual work, and each pupil can be held to strict account for the faithful use of his or her time.

The boys can use the workroom as an agricultural laboratory as well as for shop work. The preparation of boxes for testing the germinating power of seeds, the study of soils and fertilizers, experiments on the growth of plants, and a large number of similar experiments call for a special room. This room could be used by the older boys two afternoons or two

stated periods a week, by the older girls for a similar time, and possibly by boys and girls together for one period, when things of common interest, like domestic hygiene and sanitation, house planning, studies in food values, drawing, could be worked out to the advantage of all the older pupils. The workroom is needed by the girls for cutting, sewing, cooking, canning, and millinery, for laundry work, and for all other subjects directly connected with women's work in the home. A well-prepared teacher can make the workroom of a district school a very significant connecting link between the school life and the home.

A school workroom should be fitted with tables, cases, drawers, and benches, where tools and work could be kept safely during the progress of the work and when school is not in session. If possible, a small cooking stove should be installed and utilized for cooking an occasional warm luncheon for the children as a part of the work in domestic science.

FLETCHER B. DRESSLAR in
Bulletin No. 585 of the United States
Bureau of Education.

CO-OPERATIVE LAND PURCHASE IN DENMARK

IN the kingdom of Denmark, during recent years, the principle of co-operation has been applied to the purchase by small farmers of large estates. For the information of readers of THE AGRICULTURAL GAZETTE, Mr. Ericksen, a

which was 400,000 kroner (\$112,000), which included, in addition to the land, the crops, implements and live stock. The farm was mortgaged to an association for 230,000 kroner (\$54,400), which left 170,000 kroner (\$50,600), which had to be



DWELLING, STABLE AND BARN ON A 40-ACRE FARM

graduate of an agricultural school in Denmark, has supplied information with respect to the parcelling out of a particular farm at St. Restrup, Denmark.

The farm in question had an area of nearly 2,050 acres, the purchase price of

provided for by the purchasers.

Fifteen hundred acres of the land was parcelled out in 50 farms, the areas ranging from 14 acres to 43 acres. In addition 120 acres were sold to farmers outside of the co-operative organization. The remainder

of the farm was made up of 300 acres of wood-land, 55 acres of park and garden and 60 acres of agricultural land, all of which was sold to an association for the starting of a rural high school (not an agricultural school). The price of this property for the high school association was 124,000 kroner (\$34,720). The price of the land to individual farmers in the

The corporation for parcelling out large estates provides the ways and means by which the small holders are enabled to finance their purchases, that is to say, they provide security for loans for the erection of buildings, as security for this mortgages are taken on the property. The corporation also secures for the small holders exemptions from stamp duties. The state



BUILDINGS ON A 20-ACRE FARM

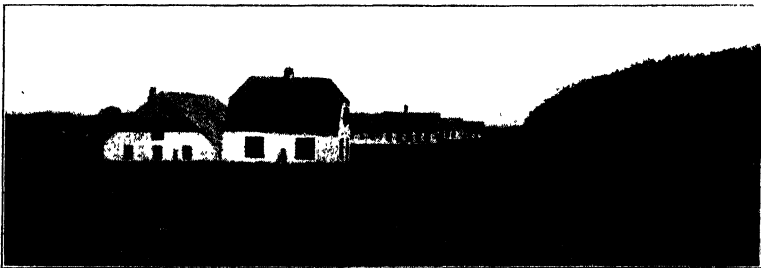
The calf in picture is a good type of a Zutlander calf, a breed much like the Holstein, and a good milk-producer. The small horses were imported from Russia

co-operative organization ranged from \$30 to \$60 an acre.

The small holders usually follow a general farming practice including an intensive system of soil tillage for the growing of grain, roots, and other fodder for feeding of dairy cattle and swine, besides a considerable area for potatoes.

assists the movement by providing loans, for which $4\frac{1}{2}$ per cent is paid; these loans are repaid on the amortization principle during a period of years.

The high school was opened on the first of April, 1915, with a course for girls in May, June and July, and for young men in November, December, January, Feb-



THE FRONTS OF SEVERAL SMALL FARMS SHOWING THE PROXIMITY OF DWELLINGS

Most of the farmers have very little capital, but still they make satisfactory progress and live comfortably. They grow much larger crops, raise more cattle and hogs than the estate produced before the land was parcelled out.

ruary and March. The high school has provision for 80 girls; during the past summer there were about 50 in attendance. Agricultural short courses, from eight to ten days each, for men and women were also provided.

THE BEST VARIETIES OF POTATOES

AN authority recently stated that we have in Canada too many varieties of potatoes. The Departments of Agriculture in Canada, Dominion and Provincial, have for years been conducting ex-

periments to ascertain among other things, which varieties are best suited for Canadian conditions. The following answers to this question are based on the experience of Canadian investigators:

	Early Varieties	Medium or Later varieties
Dominion Experimental Farms...	Irish Cobbler Rochester Rose Early Ohio	Carman No. 1 Gold Coin Empire State Green Mountain
Prince Edward Island.....	Early Rose Early Harvest Beauty of Hebron	McIntyre Dakota Red Green Mountain
Nova Scotia.....	Early Rose Early Ohio New Queen Irish Cobbler	Dreer's Standard Green Mountain Carman No. 1 Empire State
New Brunswick.....	Irish Cobbler	Green Mountain
Quebec.....	Rochester Rose Rose-Blanche Rose-hative	Carman No. 1 Late Puritan Money Maker Snowflake Green Mountain
Macdonald College.....	Irish Cobbler	Green Mountain Gold Coin
Ontario.....	Early Andes Six Weeks Early Fortune Early Dominion	Empire State Rose's New Invincible Rural New Yorker No. 2 White Elephant
Manitoba.....	Early Bovee Early Ohio	Carman Late Puritan Manitoba Wonder Wee MacGregor
Saskatchewan.....	Early Andes Early Triumph Early Ohio	Table Talk Carman No. 3 Gold Coin Wee Macgregor
Alberta.....	Irish Cobbler Rochester Rose Early Bovee Early Ohio	Wee Macgregor Gold Coin Table Talk American Wonder Country Gentleman
British Columbia..	Early Rose	Carman No. 1 Burbank Gold Coin Up-to-Date Wee Macgregor

GOOD FARMING AND GARDENING COMPETITIONS FOR INDIANS

BY J. D. McLAIN, ASSISTANT DEPUTY MINISTER AND SECRETARY, DEPARTMENT OF INDIAN AFFAIRS, OTTAWA

IN April, 1915, this Department offered a prize of \$25 to the Indian in each Indian Agency in British Columbia who had the best managed and cared for farm. The prizes were awarded on points obtained according to a schedule submitted by the Inspector of Indian Agencies for the district. The Judges were the Inspector of Indian orchards in British Columbia, and the Department's Inspector. The marks obtained by the Indians, and the result generally of the competition were so satisfactory that the Department decided to give three prizes, namely, \$25, \$15 and \$10 in each Agency, instead of one, and also to award a diploma to the winner of the first prize as certain of the Indians expressed a desire for something of that kind.

The Department has decided to continue to award prizes along the lines above indicated in the different agencies in British Columbia. Prizes of \$3, \$2 and \$1 will also be awarded to Indians who cultivate gardens, and grow therein, vegetables and flowers, but who are not in a position to do farming work. There are 15 Indian agencies in British Columbia. They lie within three inspectorates, namely, Southeastern, Southwestern and Northern. Prizes for farming were awarded in the first two inspectorates. In the Northern inspectorate agriculture is not pursued to a sufficient extent to warrant the Department awarding prizes to the Indians, but

in this last mentioned inspectorate, as well as in the other two, prizes for gardening will be given along the lines above indicated.

Following are the points given in judging for Department's prize of twenty-five dollars for best managed Indian farm in each agency:

1. Percentage of cultivable land under cultivation	10
2. State of land:	
(a) Freedom from weeds	5
(b) Rotation of crops	5
(c) Use of fertilizers	5
(d) Irrigation	5
	20
3. Stock-raising:	
(a) Animals kept	5
(b) Purity of breed.	5
(c) Care of stock	5
	15
4. Dwelling and appurtenances	10
5. Outbuildings and fences	10
6. Care of implements	10
7. Dairying:	
(a) Selection of stock	5
(b) Equipment	5
(c) Care and cleanliness	5
	15
8. Orchard and Garden	10
Total	100

THE COUNTY AGENT

THE following extracts are taken from an address delivered by Carl S. Vrooman, Assistant Secretary of the United States Department of Agriculture, before the annual conference of state leaders and state agents in County Agent work. The County Agent in the United States corresponds to the District Representative in Canada.

"The County Agent will influence his county, will rejuvenate and reconstruct his county, according to his ability to do the work that lies before him. What he accomplishes in his county is dependent not upon the possibilities open before him for they are almost unlimited everywhere, but simply upon his ability to take ad-

vantage of these opportunities. We all know that men have achieved true greatness by being pastors of rural churches, or editors of country papers, or leaders at the bar in small communities; but as yet it surprises us to learn, as I have learned in going from county to county investigating this work, that in many counties the man who is doing more than any other to advance local civilization is not the parson, not the editor, not the lawyer, nor yet the banker, but the county agent, and that where the county agent has the training and the inherent calibre and character his influence sometimes is greater in a material way than that of the parson, editor, banker, and lawyer all combined. More-

over, I have found, as you have found, that where the preachers, editors, lawyers, and bankers are men of the right type, they are getting behind the county agent and are becoming his co-workers and supporters.

"If a state could only get the vision, only could realize what it would mean if it could get to work seriously to realize its agricultural possibilities, that State could raise fifty and sixty bushels of corn to the acre while the average the country over still remained twenty-six or twenty-seven bushels; that State could raise thirty bushels of wheat to the acre while the rest of us had to be satisfied with fifteen; that State could perhaps double its agricultural output, and double the price of its farm land, and double the deposits in its banks, and double the trade of its merchants, and build up a rural civilization the like of which the world has never seen.

"Therefore, in teaching the science of the New Agriculture and in teaching the higher business efficiency on the farm, let us not forget to teach the farmer that it takes qualities of heart as well as of head, that you never got anything in this world without taking a chance, that the man who goes through life suspecting everyone but himself of incompetence and moral obliquity, is riding for a fall, and that it is up to him, as a human being, on a planet

where the progress of man has been made through the sacrifice of the blood and the lives of better men than he, or than you or I, to contribute his share to take his chance with the rest of the people, and to build up here in the future something better than we have had in the past; to join in local co-operative society, whether it is an elevator or a store, or whatever it may be; to go to the polls and vote like a patriot and not like a partisan, and do his duty as a citizen even if he is only a renter; to make of his home a home worthy of an American and worthy of a Christian, not merely a place where he and his wife and children can turn out crops to sell for cash, but a real home, a thing of beauty that will attract his children so that they will stay on the farm, a centre from which will radiate a civic influence that will elevate the life in the community to a higher plane. Unless a farmer appreciates something of the dignity and the significance of his work right on his own farm and in his own community, he will never realize anything of the higher possibilities of his great calling. For it is a great calling. I think that the farmer of the present and of the future will have the lordliest life on earth if he develops ability, character, and energy commensurate with unparalleled opportunities that are opening up before him."

A BLUE BIRD BAZAAR

BY WILLIAM FINDLAY, PRESIDENT OF THE HORTICULTURAL SOCIETY, CARLETON PLACE, ONT.

IN March of last year some members of the Carleton Place Horticultural Society, notably Mr. William McNeely, made the suggestion that we should co-operate with the schools in starting a campaign for the protection of the birds. Out of this grew the idea of the Blue Bird Bazaar. This proved a tremendous success, and was very eagerly taken hold of by the children of both sexes. Over \$400 was cleared at this bazaar, and sent to Mr. Goor, to aid in the relief of the Belgian children. About 125 bird houses were in the exhibit, some very handsome structures and others of very unpretentious designs, but all were the product of the boy's own energy or initiative in some way. These 125 bird houses were nearly all sold to residents of the town. Some few went to citizens of neighbouring towns, who were kind enough to come to see the exhibit, and it is safe to say that 100 bird houses at least now adorn all sorts of buildings and poles in the lawns and gardens of our residents.

The interest of the boys in this work was further stimulated by the society offering prizes to every boy who could produce proof in the way of a photo or reliable witnesses, that his bird house was occupied. This put a new responsibility on the boy, and he took good care to see that no bird loving cats and vagabond small boys with air rifles, were allowed in the vicinity of his bird domicile. I believe nearly all the bird houses were occupied. At first the English sparrow took possession, later there followed a series of heartless evictions when the martins, blue birds, barn swallows and wrens appeared and decided summarily that they had a priority of claim over all other applicants, and from one location on my lawn I could see at least eight or ten bird houses that were occupied, a further proof of which was, scores of martins in the air soaring round these houses. This bird was not in the habit of nesting in this particular locality before.

We found the campaign an exceedingly pleasant and profitably one and are satisfied that it has been productive of the very best results.

THE PRODUCTION OF FLAX FIBRE IN ONTARIO

ACCORDING to information furnished by Mr. James A. McCracken, Secretary, Canadian Flax Growers, St. Mary's, Ontario, the area under flax grown for fibre in southern Ontario during 1915 was about 4,000 acres. From this area the production of flax fibre was about 800 tons, which at the average price of approximately 20 cents per pound, or \$400 per ton, was of the total value of \$320,000. In addition, 80 tons of tow at \$35 per ton realized \$2,800. The same crop also produced seed at the average rate of nearly 12 bushels per acre, or a total yield of 48,000 bushels, the value of which at the average rate of \$1.60 per bushel was \$76,800. About 30 per cent of the total production of fibre is shipped to Ireland, the rest being

exported to New England states.

Most of the crop is secured on land rented from the farmer at from \$10 to \$14 an acre. Flaxstraw bought by the ton (seed on) realizes upwards of \$14.50 a ton delivered at the mill. Under the straight rental system, the farmer always performs the cultivation, and in some cases hauls in the crop when harvested. The mill operator arranges for the seeding, weeding and harvesting. The mills manufacture the retted straw into flax fibre ready for the hackles of the spinner. Retting in Canada has heretofore been done almost exclusively by the dew retting or meadow system.—*Census and Statistics Monthly, January, 1916.*

THE LAYING OF ABNORMAL EGGS

ACCORDING to a statement in "The Journal of Heredity" for March, officials of the Connecticut State Agricultural College have disproved the current belief that small and large eggs are produced at the beginning or end of the hen's laying period. This matter received careful attention by D. E. Warner and William F. Kirkpatrick during the third and fourth egg laying contest held at the Connecticut Agricultural College for the period October 30th, 1913, to June 1st, 1915.

The number of eggs laid by the 1,820 hens during the 20 months' period was 199,137, of which 103 were small (less than .09 of a pound) and 89 were large (over .179 of a pound). The small and large eggs had been credited to the hens that laid them and the weights of the individual eggs also had been taken. The 103 small eggs were laid by only 85 hens, showing that only a small percentage of the hens laid a small egg during their first year of laying. Four hens out of the 85 laid two small eggs at different periods of their productivity. One hen, No. 900, laid fourteen small eggs

at different periods and did not have a single normal egg to her credit when she was removed from the pen.

The investigators believe that the small egg is not due to the fact that it is the hen's first attempt, or to the fact that it is the end of her laying period and represents exhausted power, but rather to some mechanical interference with the hen's normal functions.

During the contest 89 eggs having an average weight of .206 of a pound were laid. Of these nearly 99 per cent were laid at the time of heavy production and in most cases the hen did not rest after laying such an egg but continued her uninterrupted yield of normal eggs. Forty-five of the large eggs were laid with no previous resting period; thirty-one were laid with a resting period of one day and ten were laid with a resting period of two days. It is concluded, therefore, that neither small nor large eggs are necessarily laid either at the beginning or end of the hen's laying period, but that they must have been laid during the time of heavy egg production.

SOCIETIES AND ASSOCIATIONS

THE PRINCE EDWARD ISLAND DAIRYMEN'S ASSOCIATION

THE annual conference of the Prince Edward Island Dairymen's Association was held at Charlottetown during the week of February 23rd. Interesting and instructive addresses were delivered by Hon. Murdock McKinnon, Commissioner of Agriculture, W. R. Reek, Director of Agricultural Instruction, Theodore Ross, Secretary for Agriculture, Prof. S. B. McCready, Prince of Wales College, Charlottetown, Rev. Father Gauthier, and Rev. Father Arsenault, Mr. H. Mitchell, Dairy Instructor, W. A. McKay, Dairy Instructor for Nova Scotia, and others.

The secretary in his report stated that the milk supply for cheese for 1915 totalled 25,774,161 lb., being an increase over 1914 of 1,971,144 lb., and the milk supply for butter for 1915 totalled 12,110,835 lb., showing a decrease for 1914 of 1,934,476 lb., but the total milk supply shows an increase over 1914 of 36,668 lb., with a total increased value of \$1,376.11.

A number of resolutions were passed, among these being the following:—

RESOLVED, That it would be in the best interest of the industry if every factory representative present could procure a copy of the material placed before this conference in regard to existing conditions to take home and place before a meeting of the board of directors at an early date, and to impress upon the directors the importance of making a personal canvas of the various milk routes with a view of having milk cooled and better cared for on the farms, also the importance of closer co-operation with the makers and factory inspector in order to bring about improved conditions.

RESOLVED, That in view of the facts presented at this conference and the importance of keeping our output of cheese and butter up to the standard of the goods we are obliged to compete with on the foreign markets we believe it would be in

the best interests of the industry to have an instructor and inspector to work among the factories and patrons during the whole year, and we further believe said instructor and inspector should be in a position to carry on his work without depending on the assessment made on the factories for his salary, and we would urge upon the incoming directors of the Dairy Association the importance of taking this matter up with the Department of Agriculture with a view of having these suggestions carried into effect along the same line followed in the other provinces of the Dominion.

RESOLVED, That in view of the facts presented at the conference and realizing the importance of having all our factories and equipment, etc., kept up to a satisfactory standard, we believe it would be in the best interests of the industry that legislation be asked for along the lines followed in the other provinces to govern the work of the factory inspector, and we would suggest that the incoming directors of the Dairy Association see that this is done at the coming session of the provincial legislature.

RESOLVED, That it would be in the best interest of the dairy industry of Prince Edward Island if provision could be made for our makers to get a dairy school training along the same lines as the makers in Quebec, Ontario and the western provinces, and we believe this could be brought about to the best advantage of all concerned by the three Maritime Provinces co-operating and establishing a dairy school course for cheese and butter makers in connection with the Agricultural College at Truro, N.S.

The officers for 1916 were elected as follows: Hon. President, Hon. L. McDonauld, East Point; president, J. A. Dewar; vice-president, W. J. Gibson; instructor, F. T. Morrow; secretary-treasurer, C. E. McKenzie.

NEW BRUNSWICK'S FARMERS' AND DAIRYMEN'S ASSOCIATION

The fortieth annual convention of the New Brunswick Farmer's and Dairymen's Association was held at Fredericton, February 28th, 29th, March 1st and 2nd. There was a large attendance. J. T. Prescott, president of the association, conducted the proceedings. Among the speakers were His Honour Lieutenant-Governor Wood; Mayor Mitchell of Fredericton; Dr. C. C. James, Federal Commissioner of Agriculture; G. C. Cun-

ningham, Dominion Plant Pathologist; Dr. W. J. Morse, of the State of Maine Experimental Station; E. D. Eddy, Chief Dominion Seed Inspector; George H. Barr, Chief of the Dairy Division, Ottawa; Col. P. A. Guthrie; Professor M. Cumming, Secretary for Agriculture, Nova Scotia; Professor Barton of Macdonald College, Quebec; R. P. Steeves, Director of Elementary Agricultural Education, and others. Resolutions were passed asking the

New Brunswick legislature to co-operate with Prince Edward Island and Nova Scotia in establishing a dairy school in connection with the Agricultural College at Truro, N.S., and to pass a law similar to the Ontario Drainage Act.

Officers were elected as follows: Presi-

dent, Geo. E. Fisher, Chatham, N.B.; vice-president, A. J. Gaudet, Memramcook; treasurer, H. H. Smith, Hoyt; recording secretary, Chas. W. Shaw, Hartland; corresponding secretary, A. R. Wetmore, Clifton.

NEW BRUNSWICK POULTRY ASSOCIATION

The annual meeting of the New Brunswick Poultry Association was held at Fredericton, February 3rd, 1916.

The election of officers for 1916 resulted as follows:—

Hon. President, Hon. J. A. Murray, Sussex; hon. vice-president, J. B. Daggett, Fredericton; president, J. V. Jackson, Moncton; vice-president, A. D. Thomas, Fredericton; secretary-treasurer, Geo. H. Seaman, Moncton.

WESTERN ONTARIO SEED GROWERS' ASSOCIATION

The annual meeting of this association was held December 7th, 1915.

The following officers were elected: President, A. McKenney, Amherstburg;

hon. president, G. H. Clark, Ottawa; vice-president, L. D. Hankinson, Aylmer; secretary, R. W. Wade, Department of Agriculture, Toronto.

THE ONTARIO PROVINCIAL WINTER FAIR

At the annual meeting of the directors of the Ontario Provincial Winter Fair, Wm. Smith, M.P., Columbus, Ontario, was elected honorary president; W. W. Ballantyne, Stratford, president; John I. Flatt, Hamilton, vice-president; John Gardhouse, Weston, R. S. Stevenson, Ancaster, J. E. Brethour, Burford, William McNeil, Lon-

don, and A. McKenney, Amherstburg, members of the executive, and R. W. Wade, Toronto, secretary-treasurer. December 1 to 7 was the week chosen for the next fair. It was decided to substitute a class for shearling ewes for the class for shearling wethers in the next prize list.

THE ONTARIO RURAL WORKERS' CONFERENCE

THE annual rural workers' conference was held at the Ontario Agricultural College on February 25th and 26th. L. Caesar, Associate Professor of Entomology, presided at the opening session and Dr. Creelman, Principal of the College, at the closing. Prof. Caesar introduced the subject "Play and Recreation; Their Value to Country Life". In the course of the discussion, tribute was paid to the work that is being done by school fairs and a suggestion thrown out that the value of farmers' institutes would be enhanced were entertainments of a varied character made a feature. Athletics in schools had not only proved physically beneficial, but they encouraged honesty, a love of fair play and manliness, and were an aid in the improvement of social life. Miss Maud Hodson, Parkhill, spoke on "Medical Inspection in Schools" and referred to the good work Women's Institutes were doing in helping to remedy the ills of children. Miss Mary Mackenzie, Superintendent of the Victorian Order of Nurses, Ottawa, told the story of the order, of the establishment of hospitals in

the lumber camps in 1900, and of the organization nine years later of the rural nursing scheme. The society had a Duchess of Connaught fund of \$223,000 set aside for the purpose of extending the work. Dr. H. W. Hill, Medical Health Officer, London, Ont., spoke on "Rural Health and Sanitation". He declared that the only way to prevent flies spreading disease was to cover up the source where they might secure germs, and that milk should be pasteurized. An interesting discussion was had on "Light, Heat, Water, Ventilation and Sewerage Systems for Farm Homes". The afternoon of the second day was devoted to demonstrations in games suitable for rural life. One speaker told of a town in Eastern Ontario that had seven churches, but no form of healthy amusement. A MacLaren, Lecturer in Rural Sociology, brought the sessions to a close with an address on "The Influence of Pageantry, Drama, Story-telling, Carnivals, etc., in arousing Community Spirit and Consciousness", accompanied by shadowgraphs of typical scenes in pioneer days.

QUEBEC SOCIETY FOR THE PROTECTION OF PLANTS

The eighth annual meeting of the Quebec Society for the Protection of Plants was held in the Biology Building of Macdonald College on Tuesday, March 14th, 1916. There was a large attendance of delegates, among whom were Dr. R. Matheson of Cornell University; Messrs. J. C. Chapais, St. Denis-en-bas; G. Bouchard, Ste. Anne de la Pocatière; Father Leopold, Professor Letourneau and Bro. Benjamin of Oka Agricultural Institute; Messrs. A. Gibson and J. M. Swaine of the Entomological Branch, Ottawa; Messrs. W. A. McCubbin and P. Cowan of the Botanical Division; A. F. Winn, G. A. Moore, Lachlin Gibb, Holmes of the Montreal branch; Rev. Dr. Corcoran of Loyola College; Fathers Fontanel and Goucie of St. Mary's College.

The following officers for the coming year were elected:—

President, Professor W. Lochhead, Macdonald College; vice-president, Auguste Dupuis, Director of Fruit Experiment Stations, Village des Aulnaies, Que.; secretary-treasurer, J. M. Swaine, Assistant Entomologist for Forest Insects, Ento-

mological Branch, Ottawa; curator and librarian, P. I. Bryce, assistant in Biology, Macdonald College.

The following resolutions were passed:—

- (1) That on account of the great damage done to orchards by various canker diseases it is necessary that a study of these cankers be made at once. The society asks that the Provincial Department of Agriculture take the necessary steps to appoint an expert on this work.
- (2) That the usual grants are available for the compilation of lists of insects and fungi of Quebec by members of the society who are willing to undertake the same.
- (3) The society places on record its appreciation of the great work of the late Henri Fabre, the eminent entomologist of France, who died October 11th, 1915. His great work "Les Souvenirs Entomologiques" will for all time be an inspiration to workers among insects.

QUEBEC MAPLE SUGAR ASSOCIATION

At the annual meeting of the Pure Maple Sugar and Syrup Co-operative Association at Rigaud, Quebec, on February 29th, a resolution was passed asking the government of the dominion to take further steps to enforce the law prohibiting the manufacture and sale of imitations of maple syrup and sugar. Addresses were delivered by Gustave Boyer, M.P., Professor J. F. Snell of Macdonald College, Rev. Father Allaire of St. Hyacinthe Agricultural College, J. H. Lefebvre, secretary of the

association, and Auguste Trudel, of Montreal. The officers elected were: Patrons, Hon. Martin Burrell, Hon. J. E. Caron, and Hon. Sydney Fisher; vice-patron, Prof. J. F. Snell; president, Gustave Boyer, M.P., Rigaud; vice-president, Charles A. Fisk, Abbotsford, Quebec. Directors: R. T. Brownlee, Hemmingford, Quebec; J. H. Grimm, Montreal; Luc J. A. Dupuis, Jr., Saint Rock des Aulnaies, Quebec; and the secretary, J. H. Lefebvre.

THE GENERAL STOCK BREEDERS' ASSOCIATION OF QUEBEC

The General Stock Breeders' Association of the province of Quebec held its 22nd annual meeting on the 8th of February at the Queen's Hotel, Montreal. This association is the federation of the four principal associations of breeders of pure bred stock in the province of Quebec. Each of these associations is autonomous, has its own Board and by-laws, and is represented by its president on the board of management of the general association.

The following officers were elected by the different associations:

FRENCH CANADIAN HORSE BREEDERS' ASSOCIATION

President, Jos. Deland, L'Acadie; vice-president, V. Sylvestre, Clairvaux; secretary, Dr. J. A. Couture, Quebec; directors,

Louis Lavelle, St. Guillaume; Arsene Denis, St. Norbert Station; Dr. J. H. Vigneau, Three Rivers; Frs. Manceau, Nicolet; Ls. P. Sylvestre, St. Theodore d'Acton; Horace Morin, St. Hyacinthe; James Bryson, Brysonville, Camille Perreault, Joliette.

FRENCH CANADIAN CATTLE BREEDERS' ASSOCIATION

President, Arsene Denis, St. Norbert Station; vice-president, G. Garceau, Three Rivers; secretary, Dr. J. A. Couture, Quebec; directors, Hon. N. Garneau, Quebec; Jos. Coulombe, St. Norbert; Ls. Thouin, Repentigny; O. E. Dallaire, St. Hyacinthe; Pierre Sylvestre, Clairvaux; J. P. Brodeur, St. Cesaire.

SHEEP BREEDERS' ASSOCIATION

President, Nap. Lachapelle, St. Paul l'Ermite; vice-presidents, James Bryson and J. E. Dion; secretary, Dr. J. A. Couture; directors, A. Denis, V. Sylvestre, Paul Lavallee, Berthier; E. H. Morgan, Stanbridge Station; Uld. Legris, Ant. Phaneuf, J. A. Lavallee, Jos. Forget, Edm. Provencher, Julien Charlebois, Jos. Couture, Dr. Forst.

SWINE BREEDERS' ASSOCIATION

President, Louis Lavallee; vice-presidents, Clovis Ouimet and F. Byrne; secretary, Dr. J. A. Couture; directors, Geo.

Hooker, Alf. Gingras, Theo. Prudel, La. Thouin, Ovide Loisele, Geo. Laliberte, Z. Riendeau, Art. Fournier, Armand Denis.

GENERAL STOCK BREEDERS' ASSOCIATION

President, Hon. N. Garneau, Quebec; 1st vice-president, Arsene Denis; 2nd vice-president, James Bryson; secretary, Dr. J. A. Couture; directors, Jos. Deland, representing the French Canadian Horse Breeders' Association; G. Garceau, representing the French Canadian Cattle Breeders' Association; Nap. Lachapelle, representing the Sheep Breeders' Association; Ls. Lavallee, representing the Swine Breeders' Association.

CANADIAN ABERDEEN ANGUS ASSOCIATION

At the annual meeting of the Canadian Aberdeen Angus Association, held at Brandon, Manitoba, on March 9th, the financial report showed that the receipts last year were \$2,370. It was decided to make grants amounting to \$2,000 to various

fairs and to issue the fourth volume of the herd book as soon as possible. J. D. McGregor, Brandon, Manitoba, was re-elected president, James Bowman, Guelph, vice-president, and W. I. Smale, Brandon, Manitoba, secretary-treasurer.

FARMERS' WEEK IN WINNIPEG

FARMERS' week at the Manitoba Agricultural College, Winnipeg, observed from February 14th to 19th, was favoured with the largest attended conventions ever held at the College. There is also reason to believe that from an agricultural standpoint they were exceptionally educative. The programme included: Home Economics convention, Canadian Seed Growers' conference, Soil Products Fair, Agricultural Societies convention, Bee-Keepers' convention, Manitoba Dairy convention, Horticultural convention, District Representatives' conference, Poultry congress, Judging competitions by high school boys and short course students and a reunion of former students in agriculture and home economics. A series of receptions, banquets and other entertainments made up a very full week. Flowering plants contributed generously by the Horticultural Department and a plentiful supply of bunting gave both the exterior and interior of the college building a pleasing and gala aspect.

THE SEED GROWERS

Mr. S. A. Bedford, Superintendent of Demonstration Farms and Commissioner of Weeds, presided at the Seed Growers' convention, held on what was termed "The Good Seed Day." Instructive addresses were delivered by the president, T. J. Harrison, Professor of Field Husbandry at the college, who laid particular stress on the good work done by the boys' and girls' clubs and the importance of seed selection;

by President Reynolds, of the college; by L. H. Newman, secretary of the Canadian Seed Growers' Association, who gave some particulars of the investigation into the quality of Manitoba seed made by the Federal Department of Agriculture in 1913; by W. C. McKillican, Superintendent Experimental Farm, Brandon, who took for his subject "Cultural Methods in Pure Seed Production"; by John Bracken, Professor of Cereal Husbandry, Saskatchewan Agricultural College, who acted as judge at the Soil Products' Exhibition and detailed results of using good seed and urged demonstrations as the best form of instruction and advertisement; by Commissioner Bedford, who dwelt on the necessity of clean land, and others.

CHAMPIONSHIP WHEAT

Professor Bracken, who was a judge at the Dry Farming Congress at Denver, Colo., last year, in finishing his labours as judge of wheat at the Soil Products' Exhibition, said in his section he had not found a single wild oat, which was something unusual for Manitoba, and that one of the samples submitted to him was the best he had ever seen. The sample was of Marquis, grown and shown by S. Larcombe of Birtle, who took the sweepstakes grand championship for wheat. The sample weighed 67¾ lb. to the measured bushel and scored 99 out of a possible hundred.

The officers elected for the Manitoba section of the Canadian Seed Growers' Association for 1916 are: President, T. J.

Harrison, Professor of Field Husbandry, Manitoba Agricultural College; vice-president, W. C. McKillican, Superintendent of Brandon Experimental Farm; secretary, J. H. Bridge, assistant to the professor of Field Husbandry; executive committee, north-western district, George Dow, Gilbert Plains; south-western district, W. R. Brockington, Elva; eastern-district, John Weiner, Miami.

BEE-KEEPERS IN SESSION

There was a large attendance at the Bee-Keepers' convention. The president of the provincial association, Rev. R. A. Rutledge, St. Charles, Man., presided, and was re-elected for 1916 with Commissioner S. A. Bedford again as secretary and G. G.

Ayrshire breeders had been that they had bred for the show ring only, while Holsteins had been bred exclusively for milk. The breeders had changed their methods now and the result was better cattle. Addresses were also delivered by Professor G. G. White, of the Department of Farm Management, who emphasized the importance of co-operation; Professor S. A. Bedford on the things necessary to make rural fairs and shows more successful; Professor John Bracken on the permanency of agriculture; L. H. Newman, secretary of the Canadian Seed Growers' Association, on the great opportunities the societies had in the movement for better seed, and Professor M. C. Herner, on co-operative poultry fattening. The committee on



EXHIBITS AT THE MANITOBA PROVINCIAL SEED GRAIN FAIR HELD AT THE MANITOBA AGRICULTURAL COLLEGE

Gunn, Lockport, Mr. W. H. Hambly, Rosevale, and Wm. Woods, Emerson, as the executive committee. It was decided that next year during Farmers' week a honey exhibit shall be held. Papers were read and discussions had on "Methods of Swarm Control," "The Sale, Grading and Advertising of Honey," "Wintering Bees in Manitoba," "Sweet Clover and other Honey Plants," and similar subjects.

AGRICULTURAL SOCIETIES' CONVENTION

President Reynolds, of the Agricultural College, welcomed the delegates at the Agricultural Societies' convention. Hon. Duncan Marshall, Minister of Agriculture for Alberta, spoke on the breeding of dairy cattle. He said that the trouble with

resolutions reported the following, which were passed without a dissentient voice:

"That the agricultural societies record their appreciation of the Department of Agriculture and the extension service section of the college in widening the scope of the provincial soil products' fair.

"That in the interests of agriculture, ploughing matches, seed grain fairs, poultry shows, standing grain and good farming competitions be encouraged in every way."

A new advisory was elected as follows:

Eastern district: Dr. McIntosh, Morden, and S. J. Holland, Morris.

Northeastern district: S. Larcombe, Birtle, and A. D. McConnell, of Hamiota.

Southwestern district: W. E. Crawford, of Elkhorn, and H. L. Dayton, of Virden.

MANITOBA DAIRY ASSOCIATION

Among those in attendance at the Manitoba Dairy Association's meeting was C. C. MacDonald, B.S.A., Manitoba's first Dairy Commissioner, at present engaged in Florida. President L. A. Race, of Brandon, in his opening address, referred to Mr. MacDonald's presence and to the first dairy school in the province established 20 years ago. In a review of the year the president directed attention to the fact that for the first time Manitoba had shipped butter to Australia. In all 53 cars had been exported, 18 going to the west and 35 to the east. An increase in shipments was expected this year. Mr. I. Villeneuve, Inspector of Cheese Factories, spoke on "Some Problems in Cheese-making." George H. Barr, Chief of the Dairy Division Dairy and Cold Storage Branch, Ottawa, delivered an address on "Paying for Milk at Cheese Factories," using a chart in illustration. Mr. W. J. Cummins, of Glenlea Stock Farm, followed with an address on Silo "Building and Filling." Professor T. J. Harrison took for his theme "Winter Feed for the Dairy Cow." Mr. G. W. Wood, associate professor of animal husbandry, dealt with "Feeding Cows for Milk." T. A. Gibson, Official Grader, made an exposition of some of the defects found in creamery butter, one of the principal being lack of uniformity in salting. Dairy Commissioner Mitchell led a discussion on "The Condition and Needs of Our Dairy Industry at the Present Time." He remarked that in 1915, Manitoba made 5,839,000 lb. of creamery butter as compared with 4,761,000 lb. in 1914, an increase of 1,078,000 lb. In 1915, practically twice the quantity of butter was made that was produced in 1912. Of cheese the province made 720,000 lb. in 1915, against 471,000 in 1914. Mr. W. S. McKillican, of the Brandon Experimental Farm, dealt with "Summer Feed for the Cow" and E. H. Farrell, Dairy Inspector, on "Work among the Creameries." Mr. Farrell agreed with Mr. Barr, who had previously spoken on the care of cream, as to the advisability of pasteurization.

The following resolutions were adopted:

"Grading cream: That this convention favours the strict grading of cream and the adoption of the following as a basis for so doing: 'Extra First': cream that is both sweet and clean in flavour. First: cream that is clean and fresh in flavour and whose consistency is smooth and even. Second: cream that is slightly stale, old or bitter or otherwise slightly defective in flavour, but is of smooth, even consistency. Cream below second to be classed as 'off grade' and either rejected or paid for according to its value.

"A difference of 2 per cent per pound of fat should be made between 'extra first'

and 'first' and a difference of 3 per cent per pound of fat between first and second grade cream.

"Pasteurization: That this convention place itself on record as favouring the pasteurization of cream at the creameries as a means of improving the flavour and keeping qualities of the butter."

The following officers were elected:

President, L. A. Race, Brandon; first-vice-president, Chas. Tully, Reaburn; second vice-president, W. J. Graham, Melita; secretary-treasurer, L. A. Gibson; directors: J. R. Nesbit, Shoal Lake, J. M. Carruthers, Winnipeg, S. Code, Dauphin, J. T. Coyle, Winnipeg, J. A. McLachlan, Virden, T. H. Rumbal, Miami, W. Johnston, Stonewall, W. L. Haight, Winnipeg, G. K. Beckman, Lundar, and A. W. Du-maine, Saltel.

MANITOBA HORTICULTURAL AND FORESTRY ASSOCIATION

At the annual gathering of the Manitoba Horticultural and Forestry Association Mrs. J. B. Hodgson, Foxwarren occupied the chair. Papers were read by Miss Barbara Stratton, Stonewall; Mrs. S. E. Clarke, Winnipeg; Prof. J. B. Reynolds, president of the Manitoba Agricultural College, and Miss Ethel M. Eadie, professor of household science. An illustrated lecture on "What Bees do with Flowers" was given by R. M. Muckle, lecturer in bee-keeping at the college. Other subjects discussed included school-gardening, insecticides, seed selection, fruit growing, and plant diseases. Mr. R. H. Strickland, M.Sc., Field Officer, Dominion Entomological Laboratory, Lethbridge, Alta., gave a full and lucid account of the work that he has been doing with regard to cut-worms and their control. Norman Ross, Superintendent of the forestry farm at Indian Head, gave an account of the work of the year in Manitoba. S. A. Bjorason, of the Brandon Experimental Farm, spoke on investigations that had been carried on during 1915.

Mr. Robson Black, secretary and lecturer of the Canadian Forestry Association, gave a lecture on "The Fight to Save the Forests." Exemplifying the destruction of the forests that was going on, Mr. Black read a letter from the vice-president of the Canadian Pacific Railway, stating that that railway used in a single year 5,000,000 track ties, 200,000 fence posts, 50,000 telegraph poles and 60,000,000 feet of lumber.

POULTRY CONGRESS

At the Poultry congress Mr. R. J. Allen, of the Poultry Division of the Federal Live Stock Branch, dwelt on co-operation and the place in the world's economy held by the Canadian egg, which he said ranked fourth

on the British market, the order being Danish, Dutch, Irish and Canadian. It should, at least, be second. R. K. Baker, professor of poultry husbandry at the Saskatchewan Agricultural College, dealt with co-operative marketing and cold storage. Professor M. C. Herner, of the college, gave a demonstration in dressed chickens. J. E. Bergey, assistant in poultry husbandry at the college, spoke on the constitution and vitality of fowls. A very successful show and sale of poultry and fancy stock was held in connection with the congress. Professor R. K. Baker and J. E. Bergey delivered addresses on the "Poultry Breeders' Opportunity" and "Poultry Farms, Success and Failure" in the evening in the Industrial Bureau.

HOME ECONOMICS

An attendance of 500 marked the convention of Home Economics' Societies. President Reynolds, of the college, delivered the address of welcome and S. T. Newton, Superintendent of Extension Service, presented the reports of the societies. Dr. Mary Crawford, of Winnipeg, and Mrs. H. W. Dayton, of Virden, gave talks on medical inspection in schools and the advantages of rest rooms. Red Cross work came in for considerable consideration. Mrs. J. D. McKenzie, of Portage la Prairie, gave an account of the rest room in her town. Mrs. H. Sykes, School Lake, chose as her topic "Rest Rooms on the Co-operative Plan."

Mr. Newton in his report said that the economics' societies in the province now numbered 68, with a membership of close

upon 3,500. Professor Reynolds emphasized the need of recreation for both boys and girls. It was announced that Virden Home Economics' society had taken first place in the competition for society exhibits, arranged under the soil products' division, then in session at the Agricultural College, while Mrs. Birtle, came second. Mrs. W. A. Elliott was announced as champion bread maker, with Mrs. W. D. Dodge, of Birtle, a close second.

This is the first year such a division had been on for the women. The number of entries far exceeded expectations. Seven societies—Virden, Selkirk, Headingly, Minnedosa, Hartney, Birtle, and Killarney—sent in exhibits, making the judging most difficult. In bread 27 entries were made. The only disappointment was the labour-saving competition. There were only two entries in this, and both were of refrigerators.

During a debate on the problem of recreation in rural communities, Rev. R. J. Murchie, announced the institution of a bureau of rural life in connection with the extension department, the business of which would be to solve this question. Miss E. M. Eadie followed with a practical demonstration of labour-saving devices which would leave time for recreation.

Professor Baker, of Saskatchewan University, gave an address intended to increase the enthusiasm of those who are already poultry producers and to convert others to this occupation. Mrs. J. S. Woods, of Oakville, explained the aims and ideals of the women grain growers.

THE SASKATCHEWAN GRAIN GROWERS' ASSOCIATION

The officers of the Saskatchewan Grain Growers' Association for 1916 are: President, John A. Maharg, Moose Jaw; vice-president, A. G. Hawkes, Percival; directors-at-large, Mrs. Violet McNaughton,

Piche; J. B. Musselman, Moose Jaw; Thos. Sales, Langham; Geo. Langley, Regina; John F. Reid, Orcadia; secretary, J. B. Musselman.

THIS YEAR IN ALBERTA

Mr. E. L. Richardson, Secretary, Alberta Live Stock Associations and Manager, Industrial Exhibition, Calgary, announces the following events for 1916:

Auction Sale of Pure bred Bulls, Beef Breeds: Calgary, April 10, 11, 12.

Spring Horse Show, Calgary, April 13, 14, 15. Entries close April 1st.

Auction Sale Pure bred Bulls, Beef Breeds, Lacombe, May 31st. Entries close May 1st.

Calgary Industrial Exhibition, June 29 to July 5. Entries close June 15th.

Co-operative Sale of Wool, Calgary,

July 28. Entries close July 10th.

Auction Sale of Sheep and Swine, Calgary, October 18th. Entries close September 15th.

Auction Sale of Dairy Cows and Bulls, Calgary, October 19th. Entries close September 15th.

Fat Stock Show, Calgary, December 12 to 15. Entries close December 1st.

Auction Sale of Cattle, Females of Beef Breeds: Calgary, December 14. Entries close November 15th.

The Provincial Seed Fair and the Calgary Poultry Show are held in conjunction with the Fat Stock Show, December 12 to 15.

THE PROTECTION OF BIRDS

The Canadian Society for the Protection of Birds, with headquarters at the Royal Canadian Institute, Toronto, has carried out a winter programme of meetings. On February 11th an address was delivered by Frank E. Payne, Secretary of the Dominion Meteorological Service, on "The Birds of Hudson Strait". On February 18th, the meeting was devoted to a symposium by members of the Society on

"Winter Observation of Birds." On February 25th, J. W. Crow, Professor of Horticulture at the Ontario Agricultural College, took up the subjects of "The Protection of Game Birds" and "Feeding Winter Birds". With these lectures lantern views were presented. The secretary of the Society is Miss Laura B. Durand, Toronto.

GOOD ROADS CONGRESS

The Third Canadian and International Good Roads Congress and Exhibition were held in Montreal on March 6th to 10th. The Congress was held under the auspices of the Dominion Good Roads' Association and the Canadian Automobile Federation. The following organizations participated: Dominion Good Roads' Association, the Ontario Good Roads' Association, the Manitoba Good Roads' Association, the

American Road Builders' Association, the Canadian Automobile Federation and the Automobile Club of Canada. The programme of addresses was confined chiefly to technical operations connected with road construction and maintenance. The Exhibition contained road materials, machinery, accessories and equipment. The Secretary of the Congress is Mr. Geo. A. McNamee, Montreal.

CO-OPERATIVE LIVE STOCK ASSOCIATIONS

In No. 2, Vol. 2, on pages 188 and 189 of THE AGRICULTURAL GAZETTE some account is given of the organization, constitution and operation of co-operative associations formed at various points, principally in the North-west provinces, for the purpose of securing financial assistance for members in the furtherance of breeding and trafficking in live stock. The particulars there given of the operations of the associations in Alberta and Saskatchewan were based on information furnished by the manager of the Canadian Bank of Commerce at Calgary. A request for information covering the operations of 1915 has elicited the following particulars:—

ELFROS LIVE STOCK ASSOCIATION

Authorized capital...	\$40,000
Subscribed capital.....	11,000
Present membership.....	58

The association's trade activities from commencement up to December 31st, 1915, can be seen from the figures herewith given of animals purchased:—

Year of	Bulls	Calves	Steers	Cows	Heifers
1914	1	22	32	4	81
1915	3	1	20	11	13
Totals	4	23	52	15	94

Total—188 head. The natural increase of the cattle up to January 1st, 1916, is 56 head. The figures, however, cannot be taken as a correct indication of the actual demand. The falling off of cattle shipped

in during 1915 is due to various circumstances. In the spring of 1915 the association had applications on file for about 100 additional head. These applications were not filled, partly because the board of directors considered the market price too high to have cattle shipped in to advantage, and partly because the association had difficulty in finding a suitable buyer at the remuneration offered, due to activity on the land.

As the summer advanced the district was faced with a fodder shortage, and, furthermore, the new exemption laws left doubt as to the position of the association's mortgage security and the bank accordingly declined to pass any further applications. It was also felt that should the association have accepted all the business offered, it would have assumed a larger responsibility than the age of the experiment warranted.

AMOUNT OF ADVANCES

The total amount advanced by the bank on the association's endorsement, up to November 4th, 1915, was reduced 31.3 per cent on that date as follows:

Total advances up to Nov. 4, 1915..	\$6,520
Payments on account at maturity..	2,044
Balance renewed.....	\$4,476

Between November 4, 1915, and January 1, 1916, more cattle were shipped in and an additional \$1,407 advanced, making the total advances on The Elfros Live Stock Association's endorsement on January 1—\$5,883.

During the fall, the bank carefully in-

vestigated the extent to which the various purchasers had actually benefitted from their membership, and it was estimated that in the one year the average financial gain of each purchaser had been 37 per cent on the amount of his purchases.

ADVANTAGES OF THE SYSTEM

While the association has been directly instrumental in increasing the live stock holdings in this district by 244 head, it has also demonstrated to non-members the advantage of cattle farming and has been indirectly instrumental in the large general increase in cattle holdings in the district. Out of 360 farmer customers of the bank, there are only seven who do not go in for cattle and who do not own the nucleus of a breeding stock.

The association's facilities for co-operative shipping have not yet been thoroughly tested. Only one car of cattle has been shipped out by the association, and this was a mixed car making the expenses of shipping somewhat heavier than an exclusive car would have cost. From this experience it was concluded that cattle can be shipped from Elfros to Winnipeg on a one-half cent per pound margin, making a net gain of one-half cent per pound for the shipper. The drovers operating in this district always pay one cent per pound below Winnipeg prices.

The association in the main has been successful and the scheme as it stands, if followed up with freer financing and better internal machinery, is a practicable one which should be of considerable advantage and benefit to the farmers and district wherever organised. However, for the further and proper development of the movement some other machinery for long-dated loans direct to the association will have to be devised. The association's present means of operation are too limited, for example, farmers in small circumstances, who do not already own the cattle allowed for in exemptions, would not be eligible, and these, if steady and industrious, are the very people who would benefit the most from the association.

To make the association of the most practical value, it should be able to borrow money direct for the purchase of the required cattle, and to resell the cattle to the members on lien notes, thus not transferring their ownership until the notes are fully paid and thereby not being affected by any exemption laws.

METHOD PURSUED AT LETHBRIDGE

This scheme was inaugurated in the spring of 1914 for the purpose of enabling small farmers of good character, but limited means, to purchase a few head of live stock as a start in mixed farming. Instead of forming a joint stock company

as was done in North Battleford and Canora, it was thought wiser to obtain the personal guarantees of some sixty local citizens in good standing, each individual guarantee being limited to \$150, giving a total available guarantee of \$9,000. The guarantors give authority to four trustees to carry on the business on their behalf, passing on all applications, signing such undertaking as may be required, taking security in connection with the business and giving discharges as occasion serves. A fund is created by adding 5 per cent to the cost of the live stock purchased and the difference between 8 per cent, which the notes carry, and 7 per cent, at which rate the bank discounts the paper, both of which amounts are credited to cash collateral account, which now amounts to \$345.96. This addition of 5 per cent is looked upon by the farmers in the light of the difference between the cash and time price for the stock and is an equitable charge.

REQUIREMENTS FOR LOANS

Each applicant is required to submit a statement of his affairs, together with several reliable references, and in the event of his loan being approved by the trustees' a loan not exceeding \$400 in all is arranged for him, a lien being taken on the relative stock and natural increase thereof in favour of the guarantors and duly registered. Ordinary negotiable notes are then made out covering periods from six to twenty-four months. The cattle are branded with the guarantors' brand and are inspected periodically by the trustees.

The following statistics show the transactions which have taken place up to the close of 1915:

Number of loans—22; now current—20; paid in full—2; stock purchased—Cattle 78 head; pigs, 9 head.

Aggregate loans	.....	\$6,342 21
Paid to date	.....	1,834.66
Balance current	.....	\$4,508.55

CHARACTER OF APPLICATIONS

The four trustees have given close attention to all applications and have evidently used good judgment in placing their risks. Some applications were declined on the ground that the financial statements submitted indicated that such assistance as was required should be given in the ordinary course of banking business. In such instances the trustees made it a practice to put in a word with the bank manager in question and in most cases the desired assistance was received. In other cases the moral and industrial status was well known to one or other of the trustees and was such that applications which appeared good enough on the face of them were declined either at once or after full enquiry.

NEW PUBLICATIONS

THE DOMINION DEPARTMENT OF
AGRICULTURE
THE FRUIT BRANCH

Marketing Georgia Peaches, by C. W. Baxter, Chief Fruit Inspector for Eastern Ontario and Quebec. Mr. Baxter in this seven-page circular, of which a very limited supply remains, illustrates the advisability of diversifying crops by Georgia's experience with excessive crops of cotton and tells of the extent to which, and the manner in which, the peach is cultivated, mainly in the central part of the state, of its character and of the methods adopted in picking, packing, grading, shipping and marketing. Although no federal or state legislation has been passed controlling these processes, a system has developed through The Georgia Fruit Exchange of so thorough a nature that it suggests useful information in its description. The organization, constitution, rules and regulations of the Exchange are fully explicated.

THE DAIRY AND COLD STORAGE
BRANCH

The Testing of Milk, Cream and Dairy By-Products by Means of the Babcock Test, by J. F. Singleton, Chief Inspector of Dairy Products; Bulletin No. 45, Dairy and Cold Storage Series. In this 24-page ciaret-coloured covered bulletin are given full descriptions of the test itself, of the instrumental parts of the apparatus, with appropriate illustrations, and of all the methods that should be followed. "It is not claimed", says the Dairy and Cold Storage Commissioner, "that anything fundamentally new is presented, but the best practices in the operation of the test are set forth with such clearness that the bulletin should make a useful and reliable handbook for those who require instruction or information respecting the testing of milk, cream, skim-milk, etc." Those important qualities cleanliness and temperature, are explicitly dealt with. Dairy-men, farmers and breeders will assuredly be profited by studying the bulletin.

THE ENTOMOLOGICAL BRANCH

Results from Spraying in Nova Scotia, by G. E. Sanders, Field Officer in charge Dominion Entomological Laboratory, Annapolis Royal, N.S., and W. H. Brittain, Provincial Entomologist, Nova Scotia Agricultural College, Truro, N.S. The authors of this eleven-page circular have been engaged in investigating fruit pests and plant diseases in Nova Scotia, and it is the results of their work in that direction that are here set forth (see also THE

AGRICULTURAL GAZETTE, Vol. 2, No. 1, page 14). They report that as a consequence of their efforts much good has been effected and that the number of those who spray has been increased and the methods of spraying improved. They have obtained considerable information of a practical nature from the fruit growers in the Annapolis Valley and have conducted an analysis in such a manner as to best demonstrate that spraying pays and is essential to profitable fruit culture. As the Dominion Entomologist says in his letter of transmittal, a careful perusal of this circular and practical application of its teaching will mean better fruit, more profit to the grower and greater satisfaction to the consumer. Tables of results with illustrations are given along with a spray calendar for Nova Scotia orchards for 1916 that it is suggested should be tacked up for reference.

THE PROVINCIAL DEPARTMENTS OF
AGRICULTURE

NOVA SCOTIA

Soils and Crops of Nova Scotia, being a reprint of a series of articles appearing in the annual report of the Secretary for Agriculture. "The plan of including a series of articles on some important phase of agriculture within the same covers as the somewhat formal statement of the work of the various divisions of the Department of Agriculture, and subsequently publishing them in a separate reprint, which was inaugurated in 1907 seems," says the introduction to this 206-page publication in greyish-green covers, "to have received the stamp of public approval." The supply of several of the issues has been exhausted, among them the issue of 1909; as a consequence some of the articles have been revised, brought up to date and repeated in this report. A number of new articles have, of course, been added. In a note to the contents it is also stated that practically all the matter contained in this report is written from the viewpoint of prices and practices prevailing at normal times. The reason for this is embodied in the hope that the value of the report will outlive the duration of the war. Secretary and Principal M. Cumming is naturally the leading contributor, his subjects being a general discussion of agriculture in Nova Scotia, the geological formations and the soils of that province, the most important element in a fertile soil, the conservation of soil moisture, farm yard manure, commercial fertilizers, and five hundred bushels of potatoes per acre. Other experts deal with kindred subjects.

QUEBEC

La Désertion des Campagnes, ses Causes, ses Remèdes (The Rural Exodus, its Causes and Remedies), by Adélaide Dugré, S.J., published as bulletin No. 19 of the Quebec Department of Agriculture.

The dangerous consequences of the rural exodus, which has been allowed to go unchecked, at an alarming rate, during the last decade, are very clearly and forcibly set forth in this pamphlet of twenty-seven pages. The causes are shown and remedies suggested in the following chapters. The question is dealt with in a very thorough and practical manner, and the bulletin deserves to be read carefully by all those who are interested and who are fortunate enough to have a knowledge of French.

We are told in the introduction that, with the exception of the provinces of Alberta and Saskatchewan, the increase in rural population in Canada has remained sadly behind the increase in population of the cities, and this disproportion, which threatens to upset the social and economic equilibrium of the nation, is steadily growing. From 1901 to 1911, the increase in rural population, for the whole of Canada, was 591,241, while the increase in city population was 1,263,922. But there has been an actual decrease of 52,184 in the rural population of Ontario and of 25,628 in twenty-six counties of Quebec. In 1901, for every 100 people living in the cities there were 165 living on the land; in 1911, there were only 119 on the land to every 100 in the cities.

Aversion for county life, because young men on the farm are treated like hired men instead of being treated as partners; the allurements of the city; routine methods making farm life a drudgery; lack of agricultural training in elementary schools; such are the main causes which are given by the author as responsible for this condition of things. Special stress is laid on the necessity of proper education at the school. The mere teaching of agriculture is not sufficient; the learning of a text-book by heart may, and is likely to have, a very different effect from the effect sought; the mind and heart of the children must be appealed to, turned in the right direction. A liking for agriculture and things agricultural must be developed.

The bulletin contains also very striking and eloquent comparisons between the free life in the open air and sunshine of the country and the life in the factories and crowded tenements of the city.

The Analysis of Maple Products, by J. F. Snell. This is a reprint issued by Macdonald College of a paper read at the 51st meeting of the American Chemical Society, Seattle, August 31st to September 3rd, 1915, and

originally published in the *Journal of Industrial and Engineering Chemistry*, February, 1916. The second title sufficiently explains the contents of the ten-page circular, namely, "Miscellaneous Observations on Maple Syrup Incidental to a Search for New Methods of Detecting Adulteration."

Report of the Roads Department. Judging by this report of 92 pages issued by Hon. J. A. Tessier, Minister of Roads, the province of Quebec has made great progress in the making of better roads in recent years. The report carries us to December 31st, 1915, and narrates that in 1915, 295.60 miles of macadamized roads were laid down, that 140.70 miles of gravel roads were made, all under the direction and with the aid of the government, and that the Roads Department had 2,220 inspections carried out. It is also stated that since 1911, 1,173.10 miles of macadamized roads and 494.57 miles of gravel roads had been made in the province under government control. Further that since 1911, the government of the province had paid \$14,584,681.12 for the maintenance and improvement of earth roads, for making macadamized and gravel roads, and for the administration of the Roads Department.

ONTARIO

Sweet Clover (Melilotus), by W. L. Fu'ner, B.S.A., Lecturer in Chemistry at the Ontario Agricultural College. In the 32 pages of which this Bulletin, No. 235 of the Agricultural College, is comprised, is contained as nearly as possible a complete description of the nature, habitat and characteristics of the various species of Sweet clover, which are given as White Sweet clover (*Melilotus alba*), a biennial usually called Sweet clover because it is the commonly occurring and most widely distributed species; Yellow Sweet clover (*Melilotus officinalis*), also a biennial with the same habit of growth as the White Sweet clover; *Melilotus indica*, a small yellow flowered annual with erect growth and early flowering habit; *Melilotus azureus*, a purple-flowered kind found in South Africa, South America and Australia. While a "Foreword" explains that the bulletin is not given circulation for the purpose of urging the adoption of the plant as a crop it is yet shown that there is abundant evidence of its agricultural value. Statistical tables are given in proof of this, showing its composition, nutrient qualities, fertilizing constituents and digestibility compared with other plants of a like genus, and at various stages. A series of illustrations add to the completeness of the bulletin.

SASKATCHEWAN

School Agriculture Circular No. 3, Rural Education Associations, outlines the need, object, organization, work and other features of rural educational associations. The object is to arouse public interest in education and its relation to rural life generally and in agricultural education particularly, and to promote and develop the school as the educational and social centre of the community.

A number of suggestions respecting work which might be undertaken by these associations are as follows:—

1. Organization of projects for school garden work by the schools of the association.
2. Organization of boys' and girls' clubs, such as: canning clubs, Boy Scout troops, Girl Guide troops, garden clubs, literary societies.
3. Organization of contests for boys and girls, such as: contests in breadmaking, preserving, woodwork, sewing, etc., and in pig feeding, calf feeding, chicken raising and egg yielding.
4. Organization of School Fairs.
5. Social service work.

The circular includes also lists of the publications of the Saskatchewan Department of Education and Department of Agriculture, and the constitution of Rural Education Associations.

School Agriculture Circular No. 4, Seed Catalogue for School Gardens, announces that the directors of school agriculture have made arrangements to insure a reliable supply of seeds for school garden work. The Co-operative Branch of the Department of Agriculture has undertaken to supply schools with seeds of vegetables, flowers, grasses, cereals, and trees at prices considerably lower than those usually charged. Through this circular teachers are offered, for school purposes only, the choice of some 23 vegetables, 32 varieties of flowers, as well as cereals, legumes, grasses, trees and shrubs. The seeds are put up in small packets and sold for four cents each. Two groups each of 27 packages of seed, sufficient for the requirements of the average school garden, have been prepared and will be supplied to teachers post-paid for one dollar per group.

ALBERTA

Farm Crops in Alberta. This is a 32-page pamphlet speaking eloquently of the productions of Alberta. After explaining that the crop area has increased from 571,614 acres in 1906 with a total yield of grain of 19,333,266 bushels to 3,184,500 acres in 1915 with a yield of 125,000,000 bushels and that the arable land of the province is estimated at 100,000,000 acres, the pamphlet goes on to speak of the resources, climate and healthfulness, giving also statistics and particulars of the rainfall, the cereal production, big yields and so on. A score of page and half-page half-tone illustrations add to the interest and lend emphasis to the text.

MISCELLANEOUS

The Canadian Seed Growers' Association, the headquarters of which are in the Canadian Building, Ottawa, has issued a sixteen page catalogue of registered and improved seed produced in 1915 and offered for sale.

The Value of Birds to Man, by James Buckland, London, England, a 24-page reproduction by consent from the proceedings of the Smithsonian Institution with the author's approval to aid the work of the Canadian Society for the Protection of Birds. In a note attached to the title page every reader of the pamphlet is earnestly asked to assist in the protection of wild birds and to correspond with the Secretary of the Canadian Society for the Protection of Birds at the Royal Canadian Institute, 198 College Street, Toronto. As might have been expected Professor Buckland makes an eloquent plea in defence of the objects of his special study. He first alludes to the fecundity and voracity of insects, then describes the value of birds in checking their march of destruction on farmland, in the forest, in the garden, in the meadow and to live stock, follows with some reference to the æsthetic and sentimental phase of the subject, and concludes by pointing out that if some check is not put upon the reckless slaughter of wild birds that goes on irremediable mischief will have been done and universal disaster result.

The Canadian Seed Growers' Association and its Work is told of in an eight-page circular. Descriptions of the best known varieties of wheat, oats and barley are also given.

NOTES

A rural education association was recently organized at Griffin, Saskatchewan, and a community club, the result of the winter agricultural short course, has been organized at Ingleford, Saskatchewan.

In 1911 the poultry and eggs sold off Canadian farms were worth between \$31,000,000 and \$32,000,000. It is estimated that the egg production alone in Canada for 1915 would be worth \$30,000,000.

The Census and Statistics Monthly, January, 1916, gives the total estimated 1915 yield of wheat in Canada as 376,303,600 bushels, and the quantity available for export as 264,173,000 bushels.

The total cheese output for the province of Ontario during the year 1915 was 115,500,000 lb. with a value of \$17,902,500; the total output of creamery butter was 27,350,000 lb. valued at \$6,079,750, making the total value of dairy products \$23,982,250.

At the tenth annual bull sale of the Manitoba Cattle Breeders' Association, held at Brandon on March 9th, 72 animals were disposed of, 61 being Shorthorns, 8 Aberdeen Angus, 2 Herefords and 1 Holstein. The highest price was \$630, paid for the 14 month old Shorthorn bull, Gloster Prince.

The International Institute of Agriculture estimates that the area sown for wheat in 1915-16 in Australia was roughly 11,634,650 acres, and the production 142,832,289 bushels, as against last year's production of 24,892,702 bushels. From this it will be seen that Australia this year is estimated to produce practically five and three-quarter times as much wheat as was harvested last season.

The question of 'The Cottage for the Rural School Teacher' is engaging the attention of many school boards throughout the United States. The state of Washington is the pioneer in this movement, having 108 teacherages, or teachers' cottages; Minnesota, Colorado, South Carolina, Oklahoma, and Idaho each have several; Nebraska has two, while South Dakota, Tennessee, California, Kentucky and Illinois have one each.

Mr. A. J. McMillan, B.S.A., who was last autumn appointed Deputy Minister of Agriculture for Manitoba, has resigned his office to become editor in chief of the *Nor'-West Farmer*. Mr. J. H. Evans, a graduate of the Manitoba Agricultural College, is acting Deputy Minister.

In the article on page 287 of the preceding number of *THE AGRICULTURAL GAZETTE* headed "The National Live Stock Week," it is stated that the Federal Commissioner of Agriculture in his address before the Ayrshire Breeders' Association said that the dairy industry of 1915 in Ontario showed an increase of "seventy" per cent over 1914. "Seventy" should read "twenty."

The authorities in Lewis and Clark county, Montana, U.S., are co-operating with the county agent in starting a travelling library among the farmers. For the first six months no charge will be made to cover the wear of the books; after this period an estimate of the depreciation will be made. If the farmers appreciate the service the county commissioners will be asked to grant an appropriation to meet the expense.

The quality of the grain crops in 1915, as determined by the weight in pound per measured bushel, is, with the exception of one or two crops, superior to that of last year and is also superior to the average of the last five years. The weights per bushel for 1915 are as follows: Fall wheat, 59.71 lb.; spring wheat, 60.31 lb.; all wheat, 60.19 lb.; oats, 36.61 lb.; buckwheat, 48.02 lb.; flax, 55.28 lb.; mixed grains, 44.98 lb.; and corn for husking 56.32 lb.

In response to an appeal made by officials of the Pure Maple Sugar and Syrup Co-operative Agricultural Association, the sugar makers of Canada contributed last year to the Canadian Red Cross Society, five tons of maple sugar and one thousand gallons of maple syrup. A similar appeal is being made this year, not only to the members of this association, but to a very large number of sugar makers situated more particularly in the province of Quebec. A much larger contribution is expected this year. The sugar and syrup are supplied to hospitals in England and France in which Canadian soldiers are placed. Transportation companies have agreed to convey these products free of charge.

The Horticultural Society, situated at Hamilton, Ontario, has secured the permission of the Board of Education to have the boys in manual training make bird houses, nesting boxes, feed boxes, etc. Early in the spring an exhibition of garden arts and crafts will be held, when as many as possible of the articles made will be sold on behalf of the children. The chairman of the Hamilton Parks Board will be asked to take over the bird houses and boxes that are not sold and have them put up in the public parks.

The Ontario Agricultural and Experimental Union, through Professor C. A. Zavitz, Secretary, announces 29 co-operative experiments for 1916. These include nine with grain crops, five with root crops, eight with forage, fodder, silage and hay crops, two with culinary crops, three fertilizer experiments and three miscellaneous experiments. Each person in Ontario who wishes to join in the work may choose any one of the experiments, while in addition members of the Union are offered small samples of seed of selected grains, alfalfa, corn, potatoes, etc., for sowing on their farms.

A feature of the annual conference, for 1915, of State Leaders in district representative work in the United States, was an illustrative district representative's office. It was equipped with a filing system for letters, bulletins, lantern slides, photographs, demonstration records, and such other apparatus and equipment as county agents in general have found useful or necessary to the best execution of their work. This included a bookcase and reference library, typewriter, multigraph, soil auger, acidity-testing apparatus, camera, stereopticon, charts, and agricultural specimens.

The Government of the Dominion, recognizing the shortage of farm labour, has taken steps to assist materially in bringing farm labourers from the United States. Advertisements have been inserted in 5,500 newspapers and arrangements have been made with the transportation companies to carry such labourers from the international boundary to place of destination at the rate of one cent a mile. Immigration agents throughout the United States have been given full instructions in the matter. The Canadian railway companies are also exercising all their publicity facilities in the same direction. The Dominion government is taking the estimates of the provincial governments as to the extent of the demand for farm help.

The county agent plan of extension work in the state of Vermont has from the first been given the strongest support by the College of Agriculture of the University of Vermont. Of the 14 counties in the state 10 now have county agents. In every county there is an organization to back up and aid in making efficient the work of the county agent. So important has the work been considered that when letters of information are written by the specialists at the college to any farmers in a county where an agent is located, copies of these letters are sent to the county agent. In this way the agent is kept informed at all times as to the information being sent by the college to farmers within his county.

The Live Stock Branch of the Dominion Department of Agriculture has issued a report covering the egg circle work in the provinces of Ontario, Quebec and Prince Edward Island for the year 1915. In Ontario 980 circle members made 1199 shipments, totalling 306,025 dozens, the gross value of which to circles was \$68,531.76, while the net value to members was \$64,003.38. In Quebec 288 members shipped 66,774 dozens of eggs, the gross value of which to circles was \$15,557.59 and the net value to members \$14,402.48. In Prince Edward Island 3,289 members made 1,702 shipments, totalling 886,338 dozens, the gross value to circles being \$179,338.12 and the net value to members \$170,175.75. In Nova Scotia 62 members of the P. G. Wash Junct. circle made 33 shipments of 11,016 dozens, the gross value to circles being \$2,625.80, and the net value, \$2,296.32. These figures, the report states, are more or less incomplete.

The experimental work in pomology being conducted at the Vineland Experiment Station by the Ontario Department of Agriculture consists chiefly of testing a large number of varieties of all the tree fruits; for example, there are 5 apple orchards which contain altogether 737 trees, over 150 varieties; of plums there are 352 trees, made up of 130 varieties; of cherries there are 396 trees, made up of 55 varieties, 32 sweet and 23 sour; of pears there are 124 varieties, and peaches 525 trees made up of 148 varieties. A number of experiments are being conducted with each class of fruit. In the apple orchards tests are being made with fertilizers, on pruning, with cover crops, different methods of cultivation and spraying; in the plum orchard, primary tests are under way; with the cherries, spraying tests; while tests in stocks for budding on, fertilizers, and in thinning are being conducted.

From the years 1902 to 1907, inclusive, there was spent upon agriculture by the Government of New Brunswick the sum of \$220,516.11. From the years 1910 to 1915 inclusive, there was spent the sum of \$329,167.46, an increased expenditure in the last named six years over the previous six years of \$198,651.35. In addition to these amounts, there was spent from the Dominion subsidy from 1912 to 1915 inclusive, \$172,735.46, making a total increased expenditure of \$281,386.81. For the first period under review, from 1902 to 1907, the grants to agricultural societies in New Brunswick never exceeded the sum of \$9,000. In the year 1907 the grant for this service was \$8,124 to 59 societies. In the year 1915 there were 115 societies with a grant of \$17,000.

The agricultural development of the state of Arizona, U. S. A., through organization, is now practically in the farmers' hands. The Arizona Farm Improvement Association is endeavouring to weld together all the other farmers' organizations in the State in order to develop a state-wide plan for building up the agriculture of the state, involving securing the enactment of necessary legislation and a solution of the marketing problem. By close co-operation with their technical advisers of the Agricultural Extension Service, it is believed that the Arizona Farm Improvement Association, through its members and affiliated organizations, may control the agricultural development of Arizona.

The Toronto Horticultural Society has adopted as their slogan "Beautify Toronto", in connection with which various schemes are being carried out. Among these is a Home Gardens' Competition in which silver and bronze medals are offered for the best ten home gardens connected with each school, carried on by the pupils under direction of the teachers. The Society also offers money prizes for specimens of vegetables and flowers exhibited at autumn school fairs. This work has been going on for two years, and is to be continued in 1916. For the guidance of the Society a letter asking for opinions and suggestions has been sent to the pupils of schools having the best results in 1915. The letter announces that to each child who replies, the Society will give a plant for his garden and each of the three most successful gardens will receive a rose bush in addition.

The question has been asked from time to time in Canada and elsewhere, whether or not large crops are more profitable than small ones. The experience of Canada last year is indicative of the experience of good and bad crops covering a period of years. United States Government statistics show that the ten years of lowest average yields of corn, per acre, in the period 1891-1910 produced an average value, per acre, of \$9.49, whereas the average value per acre for the ten years of highest yields, during this period, was \$11.49. For this period the value of the wheat crop on the ten years of lowest yield was \$8.44 as compared with \$11.49 per acre for the ten years of higher yield, being an increase of 35.5 per cent for the better crops.

The most notable and hopeful movement for improvement on Prince Edward Island has come without an effort on the part of the people of the province. In an agricultural community the great need for effecting progress is education—particularly of a technical nature—and then, after that, organization of the rural communities and farming interests. The Federal grant for agriculture, amounting to over \$26,000 annually, has trebled the amount the Island was able to devote to the work from its own small resources, and helped the educational system to include work of a technical nature which the province, unaided, could not attempt. It would seem that a special effort was being made on the Island to demonstrate the benefits of organization and direction of agriculture, as the fund is now administered directly from Ottawa through a special representative—Professor W. R. Reek, late of the Ontario Agricultural College staff. A great success of egg circles has been already made, to the surprise of the local merchants who have been compelled to improve their handling to maintain even a small measure of competition with the circles. County representatives have been placed and headquarters offices opened. Some real agricultural teaching has already been done in the Provincial Normal School under the direction of Professor S. B. McCready, also lately of the O. A. C. It is reported that a series of short courses for farmers or traveling schools, will be held in the winter. A tile factory is also being started, and when tiles can be delivered at \$15 a thousand a drainage campaign will be inaugurated with traction ditchers. If it were only economically possible to establish an agricultural high school of the type established in Alberta or Minnesota, the system of education would be further improved.—J. Waller Jones, Prince Edward Island.

INDEX TO PERIODICAL LITERATURE

Farm Dairy Machinery,

K. G. MacKay, *The Grain Growers' Guide*, Winnipeg, January 19th, 1916, page 7.

How the World is Fed,

W. J. Showalter, 110 pp., 85 illustrations, *The National Geographic Magazine*, Washington, D.C., January, 1916

The Science-Spirit in a Democracy,

L. H. Bailey, *The Nature-Study Review*, Chicago, January, 1916, page 1.

Macdonald College Magazine, February-March, 1916.

Extension Work in Poultry Husbandry, page 180.
Nature-Study Lessons, by D. W. Hamilton, page 193.

Help Yourself—How Co-operation Saved Stock Shippers at Hanley, Sask., several thousand dollars.

The Grain Growers' Guide, Winnipeg, February 2nd, 1916, page 7.

Old Country Markets are opening to our Poultry Products. Canada's Opportunity—Are we in a Position to take Advantage of it?

W. A. Brown, *Farm and Dairy and Rural Home*, Peterboro, February 3rd, 1916, page 83.

Reaching her Women,

Gertrude Coburn Jessup, *The Country Gentleman*, Philadelphia, February 5th 1916, page 301.

Some Western Canada Sheep Notes,

The Editor, *The Farm and Ranch Review*, Calgary, February 5th, 1916, page 70.

What a Hundred Acre Farm Should Produce in One Year,

A Leitch, O. A. C., Guelph, *The Canadian Farm*, Toronto, February 11th, 1916, page 2.

"Rag Dolls" to Increase the Corn Crop—Being a story of Practical Agricultural Training for Country Children,

Robert H. Moulton, *The Canadian Countryman*, Toronto, February 12th, 1916, page 195.

The Fanning Mill: Construction, Purpose and Use,

Prof. James Murray, Macdonald College, Que., *Farm and Dairy and Rural Home*, Peterboro, February 17th, 1916, page 139.

How to Reduce the Feed Bill,

Daniel McKee, *The Canadian Countryman*, Toronto, February 12th, 1916, page 199.

Building up a Dairy Herd,

S. G. Carlyle, Supt. of Alberta Demonstration Farms, *The Grain Growers' Guide*, Winnipeg, February 16th, 1916, page 12.

Review and Prospects of Sheep Industry, The Live Stock Editor, *Farmer's Advocate*, Winnipeg, February 16th, 1916, page 225.

Commercial Fertilizers and their Use in Crop Production,

Prof. R. Harcourt, *Farmer's Advocate*, London, February 17th, 1916, page 259.

Does the Canadian Farmer go to Market in Hobbles?

The Canadian Farm, Toronto, February 18th, 1916, page 5.

As the Twig is Bent the Tree Inclines,

Harold S. Fry, B.S.A., *The Canadian Countryman*, Toronto, February 19th, 1916, page 227.

What Advertising Did for Fruitgrowers,

W. H. Bunting, *The Canadian Countryman*, Toronto, February 19th, 1916, page 228.

The Farm and Ranch Review, Calgary, February 21st, 1916,

Advantages of Good Seed, by Geo. H. Clark, Dominion Seed Commissioner, page 111.

Mortgage Lifter or Mortgage Producer—Which? Address by W. F. Stevens, Live Stock Commissioner at Short Course Schools in Southern Alberta, page 112.

Seed Control in Denmark and in Canada, A. N. Brearley, page 114.

Results Obtained at the Dominion Entomological Laboratory during 1915,

G. E. Sanders, Field Officer in Charge Annapolis Royal, N.S., *The Maritime Farmer*, Sussex, N.B., February 22nd, 1916, page 310.

Planning for Spring Work and the New Crop,

J. W. Stark, B.S.A., District Representative, Peel County, *Canadian Farm*, Toronto, February 25th, 1916, page 4.

The Economical Use of Artificial Fertilizers,

Daniel McKee, B.S.A., *The Canadian Countryman*, Toronto, February 26th, 1916, page 260.

The Country Gentleman, Philadelphia, February 26th, 1916.

A Kansas Community House, C. M. Harger, page 436.

The Cottage for the Teacher, Grace Viall Gray, page 485.

The Farmer's Magazine, Toronto, March, 1916,

Our Dairy Snobocrat, Prof. H. H. Dean, page 11.

The Cult of the Farm Garden, Alex. McPherson, page 13.

Alfalfa Culture in the West,

Country Life in Canada, Winnipeg, March, 1916, page 5.

The General Purpose Fowl,

The Canadian Poultry Review, Toronto, March, 1916, page 99.

When Heifers are Forced into Early Breeding, Vigor and Constitution is Retained,

W. M. Kelley, *The Ottawa Valley Journal*, Ottawa, March 17, 1916, page 12.

The Farmer's Magazine, Toronto, February, 1916,

The Call to Farm Life, by Prof. J. B. Reynolds, page 15. Small Tractors on Eastern Farms, by R. M. Gordon, page 24. A Livestock Survey for 1916, by James E. Poole, page 32. The Stride of the Junior Farmer, by Genevieve, page 39.

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CONTENTS

	PAGE
The Agricultural War Book.....	397

PART I

DOMINION DEPARTMENT OF AGRICULTURE

The Entomological Branch:—	
Outline of Work Projected for 1916, by Dr. C. Gordon Hewitt.....	400
Spraying Materials for the Apple.....	403
The Seed Branch:—	
Seed Testing 1915-16, by John R. Dymond.....	403
The Dairy and Cold Storage Branch:—	
The Outlook for Cow-Testing, by Chas. F. Whitley.....	406
The Health of Animals Branch:—	
Notes, by Dr. F. Torrance.....	407
American Bacon Cured in Canada.....	408
The Animal Contagious Diseases Act.....	409
The Live Stock Branch:—	
Statement with Respect to the Loan of Rams and Boars to Farmers' Associations, by T. Reg. Arkell.....	409
A Thoroughbred Stallion from the Royal Stud.....	410
Assistance to Wool Growers' Association in Grading and Classifying Wool for Market, by T. Reg. Arkell	411
The Fruit Branch:—	
Fruit Meetings	412
Inspection of Small Fruits.....	413
Fruit Prospects.....	413

PART II

PROVINCIAL DEPARTMENTS OF AGRICULTURE

Agriculture in Canada:—	
Nova Scotia, by M. Cumming.....	414
Pasture Crops in the Prairie Provinces:—	
Manitoba, by T. J. Harrison.....	419
Saskatchewan, by J. Bracken.....	424
Home Labour-Saving Devices:—	
New Brunswick, by Miss Hazel E. Winter.....	431
Macdonald College, by Miss Frederica Campbell.....	431
Manitoba, by S. T. Newton.....	432
Saskatchewan, by Miss Abbie de Lury.....	432
British Columbia, by William J. Bonavia.....	433
Nova Scotia:—	
The Industrial Farm System, by E. M. Armstrong.....	434
Quebec:—	
Agricultural Legislation.....	435
Bacterized Peat or Humogen, by Wilfred Sadler	436

Ontario:—	PAGE
Boards of Agriculture.....	439
Drainage Work for 1916, by J. R. Spry ..	441
Live Stock Short Courses 1915-16, by Geo. A. Putnam.	442
Summer Series of Women's Institute Meetings.	443
Notes from District Representatives.. . . .	443
Manitoba:—	
Alfalfa Hybridization, by William Southworth...	445
Notes:—	
Popular Agricultural Posters	447
Agricultural Instruction Among Non-English People	447
More District Representatives.	448
Saskatchewan:—	
Noxious Weeds	449
Dairy Instruction Car...	449
Alberta:—	
Short Course Schools, by H. A. Craig.	450
British Columbia:—	
A Publications Branch Formed, by W. E. Scott	451
Inspection of Fruit Pests, by W. E. Scott	452
Women's Institute Conferences	452
Foul Brood Inspection	453

PART III

RURAL SCIENCE

School Fairs for 1916:—	
Nova Scotia, by L. A. DeWolfe	454
Quebec, by J. C. Magnan	454
County of Pontiac, by J. K. King	456
Manitoba, by S. T. Newton	457
Saskatchewan, by A. W. Cocks	458
Saskatchewan:—	
A School Garden Organization, by Fred W. Bates	459
Rural Education Associations	462

PART IV

SPECIAL CONTRIBUTIONS, REPORTS OF AGRICULTURAL ORGANIZATIONS, NOTES AND PUBLICATIONS

A Simple Method of Cataloguing Agricultural Literature Suitable for the School Library	466
The Teaching of Science	468
The Teaching of Elementary Agriculture	471
The Preservation of Bird Life	472
A Public School Cow	473
Farm Management Demonstration Work	474
Societies and Associations	475
New Publications...	481
Notes.....	484
Index to Periodical Literature.....	488

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OF CANADA

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MAY, 1916

No. 5

THE AGRICULTURAL GAZETTE of Canada is published monthly, in English and in French, by the Dominion Department of Agriculture. It is not intended for general circulation. A limited number of copies, however, are available to subscribers at \$1.00 per annum, or 10 cents per copy.

Subscriptions should be forwarded to the Editor, Agricultural Gazette, Ottawa.

THE AGRICULTURAL WAR BOOK

THE Agricultural War Book for 1916, announced in the April number of THE AGRICULTURAL GAZETTE as a feature of the "Production and Thrift" Campaign, has been completed. The book, which contains 250 pages, opens with a message to the farmers of Canada by the Honourable Martin Burrell, Minister of Agriculture. The work is a comprehensive volume compiled and edited by Dr. C. C. James, Agricultural Commissioner.

THE WAR AND FINANCE

Under the heading of "War and Finance" extracts from the budget speech of the Minister of Finance are reproduced which show Canada's duty, the necessity for increased production and the cost of the war. It is shown that the total trade of Canada for the past year aggregated \$1,200,000,000, an increase of nearly \$200,000,000 in exports and a slight reduction in imports. This is stated to be the largest aggregate trade in the history of the Dominion. Assuming that the indebtedness of Canada on account of the war will reach \$500,000,000 we shall from this be faced with an annual interest charge of approximately \$25,000,000. This sum, states Sir Thomas White, with a substantial amount added yearly for a sinking fund could, in his opinion, be met, provided strict economy be practised by governments, from the future revenues of the Dominion.

A comparison between the wealth of Germany and the United Kingdom in 1907 is shown in an article reproduced from "The Round Table" of December, 1915, in which the following table appears:

	ENGLAND	GERMANY
Goods and services produced and received, about.	£2,150,000,000	£1,960,000,000
Goods and services consumed	1,800,000,000	1,560,000,000
Surplus wealth.....	350,000,000	400,000,000

The capital of the British Empire outside of the United Kingdom is shown to be £7,300,000,000 and income £1,380,000,000. Of this amount Canada is credited with a capital of £1,350,000,000 and income £270,000,000.

The nation's need is graphically set forth in a manifesto that was drawn up and signed by a number of bankers and others in close touch with financial

conditions in Great Britain. Tables dealing with the cost of the war show that the increased interest of the warring countries estimated up to March 31st, was, for the Allies \$1,345,000,000, and for the Teutons \$910,000,000. Other equally interesting statistics are included in the section dealing with the war and finance.

PRODUCTION IN 1915

A section is devoted to the production in 1915 in which it is estimated that, deducting the food fed to stock, the returns of the farms, orchards and gardens of Canada gave a net product of over \$1,000,000,000, which is stated to be fully \$300,000,000 in excess of the value of these crops in any previous year.

THE 1916 REQUIREMENTS

The necessity for abundant production in 1916 is shown in a number of extracts from addresses and articles of authorities throughout Canada. This statement is significant:

"The defence of civilization now depends upon the staying powers of the Allies and the development of their efficiency. Let the farmers and food producers of Canada once more renew their efforts and see to it that nothing is lacking in the economic use of their labour. The hope of Canada lies largely in the efficiency of her agriculture."

Nor does the War Book demand increased production without affording information as to how this may be secured. A section headed "Crop Production" contains articles by such leading authorities in Canada as the Director of Experimental Farms, the Professors of Field Husbandry in the Manitoba and Saskatchewan Agricultural Colleges, Superintendents of Experimental Stations and a number of others. These authorities deal with soil cultivation, crop rotation, rate of seeding and the growing of potatoes. The Dominion Entomologist quotes a Swiss motto "To cultivate the soil is to serve one's country" and shows

that Canada loses from the depredations of insects over \$125,000,000 annually. This official deals also with the methods of insect control in which the following are recommended: clean farming, the rotation of crops, the protection of native birds and watchfulness.

GOOD SEED

A section on good seed includes recommendations and advice from the Dominion Seed Commissioner, the Secretary of the Canadian Seed Growers' Association, the Dominion Cerealists, the Secretary of the Ontario Agricultural and Experimental Union and others. It is shown that Canada requires 40,000,000 bushels of seed each spring to sow the area at present devoted to the production of ordinary farm crops, and it is pointed out that the average yields obtained are frequently deplorably low on account of the use of inferior seed. An increase of five bushels per acre in the yield of wheat at \$1.00 per bushel means an increase to the revenue of the country of \$55,000,000.

FERTILIZERS AND THEIR APPLICATION

Fertility and fertilizers are dealt with in a series of articles by the Dominion Chemist, the President of the Nova Scotia Agricultural College, the Professor of Chemistry of the Ontario Agricultural College and other authorities. Comparatively small applications of manure at short intervals are said to be more effective than large dressings applied at less frequent intervals. When clovers and other leguminous crops are turned under they may add from 50 to 150 pounds of nitrogen per acre, thus vastly increasing the soil's productiveness. Dealing with the subject of lime, Professor Harcourt, of the Ontario Agricultural College says:

"Taking into consideration all the important functions of lime in the soil and the fact that our soils are steadily losing their lime and that none of our farm crops will grow in an acid soil, it is evident why the application of lime is so important."

FARM DRAINAGE

Farm Drainage is dealt with by Professor W. H. Day of the Ontario Agricultural College and Mr. W. W. Hubbard, Superintendent of the Experimental Station at Fredericton, New Brunswick. The former states that the average returns from fourteen demonstration plots in 1915 showed a difference of \$4.48 per acre in favour of the drained land.

LIVE STOCK AND DAIRYING

The live stock industry occupies twenty-eight pages. The Live Stock Commissioner, the Assistant Live Stock Commissioner, Professor Day, of the Ontario Agricultural College, and other authorities have contributed to this comprehensive section. After showing the necessity for greater production of meat products emphasis is laid upon the necessity for organization in marketing and in production. The view is expressed that only by co-operation between those two great lines of effort will the future of the Canadian live stock industry be assured. The present opportunity for the Canadian stockman is outlined by the Live Stock Commissioner who lays down the following important factors:

1. The laying of the foundation now by conserving breeding stock.
2. Improvement in the quality of live stock products by intelligent breeding—the use of good sires, the weeding out of all scrubs both male and female, consistent adherence to one breed, early castration of calves and of lambs.
3. Improvement in the care and feeding of young animals and improvement in the finishing of animals for market.
4. The providing of a steady volume of trade by remaining continuously in

the ranks of the live stock producers despite temporary and sometimes discouraging fluctuations in price as governed by the world's demand for live stock products.

The necessity for increasing our herds and flocks is shown in an article on the killings of swine, cattle and sheep, which makes it clear that the production of live stock in Canada is not keeping up with the great demands made on our meat supply for foreign requirements. A table showing the beef cattle population of Canada shows a decrease of nearly one million head from 1910 to 1914.

The dairying industry is making progress. It is shown by Mr. J. A. Ruddick, Dominion Dairy and Cold Storage Commissioner, that from 1901 to 1911 the number of milch cows in Canada increased by 7 per cent. During this period the improvement in milk production per cow amounted to 33.5 per cent. The exports of butter fell from 1910 to 1915 from 4,615,380 lb. to 2,724,913 lb., and of cheese for the same period from 180,859,886 lb. to 137,601,661 lb.

The poultry industry has shown great advances. It is estimated by Mr. W. A. Brown, of the Live Stock Branch, that the eggs produced in Canada for 1915 were worth thirty millions of dollars.

More than one hundred pages of the book deal with the following subjects—special crops, wheat and the war, backyard and vacant lot gardening, thrift, women and the war, the call to the colours, patriotic and relief work and miscellaneous. The book concludes with a list of bulletins, available for distribution, issued by the Dominion and provincial Departments of Agriculture.

PART I

Dominion Department of Agriculture

INFORMATION SUPPLIED BY OFFICIALS OF THE VARIOUS
BRANCHES REPRESENTED

THE ENTOMOLOGICAL BRANCH

OUTLINE OF WORK PROJECTED FOR 1916
BY C. GORDON HEWITT, D.Sc., DOMINION ENTOMOLOGIST

A very full programme of work has been arranged for this season and the following outline is given with a view to indicating the special lines of investigation that will be followed. An examination of these projects by those whose interests they affect may be the means of making them of service to a greater number or of securing further co-operation in a branch of work in which co-operation leads to greater usefulness with a minimum amount of wasted effort.

One of the chief new developments is the organization of an intelligence system for the purpose of bringing the entomological service of the department into still closer touch with the agriculturists, foresters and others whom we are in a position to assist. The establishment of the entomological field stations was the first step in the direction of closer contact with local problems and needs; the organization of an intelligence system, which has now been authorized, will very materially assist in perfecting the lines of communication between those who are prepared to assist and those who need assistance. An explanation of this proposal will be given in

a future article when the arrangements have been completed.

It will be more convenient to describe the work proposed for this season under the usual grouping adopted than under the individual field stations.

INSECTS AFFECTING FIELD CROPS

Locust control work which has afforded such valuable results during the previous two or three seasons, particularly in the province of Quebec, as described in this journal, will be continued as opportunities occur. The investigations on white grubs will be continued at the laboratories at Strathroy, Ont., and Treesbank, Man., and the completion of other lines of work will permit similar investigations to be started at Ottawa. The work on the control of the onion maggot (*Phorbia ceparum*) already commenced at Ottawa will be continued.

The study of Oscinid flies affecting cultivated grasses and cereals, particularly in the prairie provinces, will be continued at Treesbank, Man. The work of previous years on cutworm control will be continued where opportunities occur. In Southern Alberta a study of the natural fac-

tors controlling cutworms or tending to aid their increase are being studied.

INSECTS AFFECTING FRUIT CROPS

In Nova Scotia the investigations on the best means of controlling the bud-moth, fruit-worms and other biting insects affecting the apple, will be continued, and arrangements have been made for testing out a large number of new and promising insecticides in orchards throughout the Annapolis Valley. The work of previous seasons has resulted in a marked increase in the number of fruit-growers who spray and an improvement in spraying methods with a consequent increase in the production of better fruit. In this line of work co-operation with the provincial Department of Agriculture is being undertaken wherever possible.

Last year a beginning was made in the province of Quebec of putting into practical operation the results of the work of previous seasons on insects affecting the apple. Experimental and demonstration work was undertaken with promising results in certain sections where spraying was not generally practised. In this work the provincial Department of Agriculture is co-operating by supplying insecticides and spraying machinery. Control work on the apple maggot will also be undertaken.

In the Niagara district the investigation of the different species of *Aphis* affecting apples and nursery stock will be continued at the Vineland Station laboratory (Jordan Harbour Experiment Station). Insects affecting bush and small fruits are also being studied.

Several new lines of work will be undertaken in British Columbia. In the Saanich peninsula, Vancouver Island, an investigation of the recently discovered outbreak of the pear thrips is being made and with the co-operation of the Provincial Department of Agriculture a spring spraying campaign has been undertaken in the

affected region. In the same district further work on the control of the strawberry root weevil (*Otiorynchus ovatus*) will be carried out. In the Okanagan Valley a thorough study of the codling moth is to be commenced with a view to determining its life-history under local conditions and the methods of control. Work on other insects affecting fruit in the province will be continued.

INSECTS AFFECTING FOREST AND SHADE TREES

In addition to the continuation of investigations already commenced a number of new enquiries will be started. It is proposed to investigate forest insect conditions in Quebec and Northern Ontario more thoroughly than has been possible heretofore; special attention will be paid to injury by borers to spruce and pine in eastern forests. Experimental work will be carried out on the control of *Chermes* affecting spruce and the elm bark louse. The borer affecting birches in the east and other shade-tree insects will be studied.

Insects affecting shade trees in the prairie provinces will be studied with a view to improving control measures. The extension of tree-planting on prairie farms render such an investigation increasingly necessary.

In British Columbia, where the greater part of our forest insect work has been carried out, the work will be extended. An investigation of the borer injury in western cedar, involving a study of its distribution, life-history and habits, and extent of infestation, will be made. In southern and western British Columbia the bark-beetle investigations will be continued; this work will largely involve direct preparation for practical control measures which we hope to have put into operation next winter in co-operation with the Forestry Service of British Columbia. At the laboratory in Stanley Park, Vancouver, other studies will be made, particularly on the alternate hosts

of the green aphid and *Chermes* affecting conifers.

INSECTS AFFECTING DOMESTIC ANIMALS AND MAN

Owing to the increase in the prevalence of warble flies in certain sections of Quebec devoted to dairy farming, an enquiry into the distribution and best means of controlling these insects under local conditions is being undertaken from the laboratory at Hemmingford, Que. The study of the distribution in Canada and control of other species of insects and ticks affecting live-stock internally and externally will be continued.

Further progress will be made in the collection of material and data necessary for a study of Canadian mosquitoes and an investigation of the breeding habits and control of western mosquitoes is contemplated.

The campaign against the house-fly will be continued through co-operation with local health authorities and organizations similarly interested, and further investigations on methods of control and the bionomics of this insect are planned.

Experiments on the control of bed-bugs by the superheating method will be continued as opportunities occur. A study of the life-history of the clothes' moth is also being made.

INSECTS AFFECTING GREENHOUSE AND GARDEN

A large amount of information has been secured concerning insects affecting florists' and greenhouse-grown plants, and with a view to making a more complete study of these pests an enquiry has been undertaken into the various insects occurring in greenhouses, their prevalence, life-histories and control. Greenhouses in Montreal, Toronto, Ottawa and elsewhere have been visited, and it is proposed to continue this work at Ottawa and the Vineland Station laboratory, especially in view of the specific request of the Canadian Horticultural Association for this investigation.

Certain important insects affecting garden-grown plants and crops will also receive attention.

INSECTS AFFECTING STORED PRODUCTS

In view of the increase in storage facilities for various vegetable products, an investigation has been commenced into the prevalence of insects in grain elevators, flour and feed warehouses, cigar and dried fruits stores. The further extension of the control of such insects by superheating and other methods will be undertaken.

THE IMPORTATION AND STUDY OF PARASITIC INSECTS

Through the co-operation of the United States Department of Agriculture, the collection in Massachusetts and breeding out at the Gypsy Moth Laboratory, Melrose Highlands, Mass., of the parasitic and predatory insect enemies of the brown-tail and gipsy moths and the shipment to Canada of these useful insects will be continued. From the Fredericton laboratory they will be colonized in Nova Scotia, New Brunswick and Quebec. This work was recently described in the pages of this journal. At the Fredericton laboratory the intensive study of the natural means of control of native insect pests, particularly the tent caterpillars, spruce budworm and fall webworm, will be continued. This constitutes one of the most important and interesting lines of work now being undertaken by the branch.

It is not possible to outline completely the work of any season, as one of the peculiarities of our work consists in the possibility of unforeseen outbreaks of insect pests. A constant state of "preparedness" is therefore necessary. The distribution of the field stations makes such preparedness more complete and the organization of an intelligence system will perfect the work of the branch still more.

SPRAYING MATERIALS FOR THE APPLE

ATENTION is directed to the table that appears on page 306 of THE AGRICULTURAL GAZETTE, April number, having reference to materials tested in spraying six-year-old Wagner apple trees. Owing to incorrect spacing in the columns the items in the first column do not appear to correspond with those following. Correct spacing by the printer would have made it clear that the combinations of materials mentioned in the first column correspond in number (ten) with the dates and results shown in the succeeding columns, as follows:—

- No. 1. Consists of soluble sulphur, 1 lb.-40 gals.
- No. 2. Soluble sulphur, 1 lb.-40 gals. and hydrogen lead arsenate, 2 lb.-40 gals.
- No. 3. Soluble sulphur 1 lb.-40 gals. and neutral lead arsenate 2 lb.-40 gals.
- No. 4. Soluble sulphur 1 lb.-40 gals. and arsenate of lime $\frac{3}{4}$ lb.-40 gals.
- No. 5. Lime sulphur sp. g. 1.008.
- No. 6. Lime sulphur sp. g. 1.008 and hydrogen lead arsenate 2 lb.-40 gals.
- No. 7. Bordeaux, 4-4-40.
- No. 8. Bordeaux, 4-4-40 and hydrogen lead arsenate, 2 lb.-40 gals.
- No. 9. Soluble sulphur, 2 lb.-40 gals. and hydrogen lead arsenate, 4 lb.-40 gals.
- No. 10. Soluble sulphur, 2 lb.-40 gals. and arsenate of lime $1\frac{1}{2}$ lb.-40 gals.

THE SEED BRANCH

SEED TESTING 1915-16

BY JOHN R. DYMOND, SEED ANALYST

THE seed laboratory year 1915-16 began September 1st last. During the first seven months, i.e., to April, 1916, 10,208 samples were received at the Ottawa laboratory as compared with 9,022 for the same period last year.

MOST SAMPLES RECEIVED IN MARCH AND APRIL

About 25 per cent of the trade samples tested during the year are received in March. For the two months from the middle of February to the middle of April the number of samples received daily averages over 100. Most of the official samples taken by the inspectors in connection with the enforcement of the Seed Control Act are also received in this period. This means that more than half the samples tested during the year are received within two months.

The following table indicates the approximate percentage of the trade samples during each month:

September	3 per cent
October	4 "
November	6 "
December	8 "
January	12 "
February	15 "
March	25 "
April	18 "
May	6 "
June	1 "
July	1 "
August	1 "

SAMPLES FOR TEST SHOULD BE SENT EARLY

The nature of the information required in connection with these samples makes it essential that they be examined and reported upon with the least possible delay. It is the aim of the laboratory to issue reports on all samples on the day on which they are received and reports are seldom delayed longer than thirty hours after the receipt of samples.

For their own advantage, and to help equalize the laboratory work, farmers and merchants are urged to

send samples as early in the season as possible. During the fall and winter more time can be devoted to individual samples than is possible during the later rush. Farmers are advised to send samples of their seed as soon as it is threshed. If it contains weed seeds or other impurities that may be easily removed by sieves in ordinary fanning mills, the proper sieves are recommended by the laboratory when the report on the test is sent. Thus the grower is often enabled to clean his seed himself and dispose of it to better advantage than if forced to sell it in the dirty condition in which it comes from the huller or thresher.

QUALITY OF TIMOTHY AND CLOVER SEED

Most of the samples received from the larger seed merchants are from seed grown in the United States. This is apparent from a study of the impurities and general quality of the seed itself. The proportion of red and alsike clover samples of American origin is unusually high this season, due to the inferior crop of these varieties in Ontario last fall.

The Ontario clover seed crop was very poor both in quality and a larger percentage than usual of the samples received from growers are *rejected*.

Red clover.—The percentage of farmers' samples of red clover seed coming within the various grades is as follows:

No. 1	2 per cent
No. 2	6 "
No. 3	38 "
Rejected	54 "

In every one hundred samples the following weed seeds occur in the number of samples indicated:

Noxious:

Ribgrass	68
Night-flowering catchfly	59
Ragweed	50
Docks	28
Canada thistle	15

Other sorts:

Green foxtail	88
Lamb's quarters	60
Black medick	35
Pale plantain	35
Mayweed	18

The extent to which samples are often contaminated by weed seeds may be more easily realized when it is known that sowing red clover containing 2500 weed seeds per ounce at the rate of 12 pounds per acre is equivalent to placing nearly 100 weed seeds on each square yard. Samples frequently contain more than 2500 weed seeds per ounce.

Careful cleaning of red clover over the 4 x 24 woven wire screen (containing four wires to the inch one way and 24 to the other) will remove many of the seeds of ribgrass, Canada thistle, lamb's quarters, pale plantain and mayweed. The one-eighteenth inch perforated zinc screen is recommended for night-flowering catchfly.

On account of their similarity in size or weight to the red clover, the seeds of ragweed, docks, green foxtail and black medick are very difficult to remove. When there are not too many of these weeds they should be cut or pulled by hand before the crop is cut for seed. When this is not practicable, a proper system of rotation and cultivation should be adopted to eradicate them.

Alsike.—Night-flowering catchfly and black medick are the commonest impurities in alsike and they are so nearly of the same size as the clover seeds that they are practically impossible of separation by sieves in an ordinary fanning mill. As in the case of red clover, a higher proportion of the samples this year grade *rejected*.

Timothy.—Most of the timothy seed sold in Canada is imported from the United States. The general quality varies considerably from year to year, depending on the weather conditions. As a rule the seed from the middle-western states is fairly pure but during the past season most of it

has been too badly hulled to grade No. 1.

This season considerable Idaho seed has been imported. It is very bright, is sometimes quite badly hulled, and, in common with most United States samples, is small in the berry. Seed grown in Prince Edward Island, Quebec, Alberta and portions of Ontario and Saskatchewan is much larger and plumper than the imported seed, and there is no reason why these provinces should not produce sufficient of the very highest quality to supply the Canadian market.

A larger number of samples than usual have this year come from Prince Edward Island. Most of this seed has been plump, bright, and not badly hulled, but often has to be rejected or graded No. 3 on account of the prevalence of weed seeds. The most common impurity is sheep sorrel. This seed is only slightly larger than timothy and to remove it much of the plumpest and best timothy must be wasted. Cinquefoil, plantain and chickweed are other common impurities, but these are easily removed by careful cleaning over the 28 x 28 woven wire screen. The most objectionable impurities from the cleaning standpoint are sheep sorrel, ribgrass, ox-eye daisy, spurrey and scentless camomile.

Some of the finest samples of timothy ever received at the laboratory have come this year from Quebec. Several have graded Extra No. 1.

Unfortunately also much of the Quebec seed is foul with ox-eye daisy and other noxious weed seeds.

Alberta timothy is usually badly hulled. To prevent this the crop should not be allowed to stand a day after reaching the proper stage of maturity. On the other hand, too early cutting has to be avoided on account of its injurious effect on the vitality of the seed. The crop should be cut as soon as a brown tinge is evident over the field, and if the weather is favourable, threshed within five days after cutting. In threshing care should be taken to see that the concaves in the thresher are not set too close and that the machine is not run too fast.

GERMINATION WORK

Corn.—In connection with the new "control" method of marketing seed corn in the ear, more than 6,600 ear tests have been made this season. The results are not as high as are obtained some years, but most of the lots tested have averaged above 90 per cent and many above 95 per cent germinable kernels.

Western grain.—Although serious frosts were not general in the west until most of the grain was ripe, considerable injury was done by local frosts in some districts. The following is from the report of J. R. Fryer, seed analyst in charge of the Calgary laboratory. The report covers the period from September 1, 1915, to February 22, 1916:

	Percentage of samples showing less than 80 per cent germination.	Percentage of samples showing less than 50 per cent germination.
Manitoba:		
Oats	41 per cent	12 per cent
Barley	36 "	9 "
Saskatchewan:		
Oats	32.5 "	15.6 "
Barley	26 "	9 "
Alberta:		
Oats	39.5 "	11.5 "
Barley	16 "	5.4 "

THE DAIRY AND COLD STORAGE BRANCH

THE OUTLOOK FOR COW-TESTING

BY CHAS. F. WHITLEY, IN CHARGE OF DAIRY RECORDS

A decided increase in cow-testing is expected for 1916. Requests by mail from individual dairymen, that is from those not connected with any organized cow-testing association, have been quite brisk the last few weeks, with a growing demand for the daily milk form on which to record the weight of each milking; the herd record book, ruled for entering monthly the production of milk and fat with the cost of feed for twenty cows, is also in strong request.

In each of the 35 dairy record centres the testing of milk samples is done monthly at many different points; so that, counting these and the cow-testing associations where again the samples are tested monthly at the cheese factory or creamery, there are upwards of 320 places where this work is in progress systematically, giving an excellent object lesson in the individuality of dairy cows. The high level in July, 1915, of over twenty-three thousand samples of milk tested for fat will probably be exceeded this year.

The supervisor for Ontario, Mr. H. W. Coleman, states that the prospects for this province look very bright. Nearly all recorders have had to answer calls from new ground; old members who dropped out are returning. As a result of the work carried on by officials of this branch co-operating with the Ontario Department of Agriculture in the short courses, considerable interest has been created among the younger boys, so that a goodly number are preparing to weigh and sample.

The supervisor for the province of Quebec, Mr. J. B. E. Trudel, in writing of the work states that over one thousand farmers in that province

are now members of cow-testing associations and dairy record centres; their ranks promise to be swelled considerably in 1916 because the importance of milk records is being better realized as necessary to an intelligent system of feeding and raising good, profitable cows.

Profits increase the interest in dairy work, and dairy records show the way to larger profits.

A large number of men keep records privately without reporting results to the department.

A notable result of the efforts in behalf of dairying made by the colleges of agriculture, the domestic science schools and the short courses in agriculture, is the fact that both boys and girls are keen on taking weights and samples of milk. Recently, too, much interest has been shown by the officials in charge of the city of Montreal health department in spreading a knowledge of cow-testing.

With regard to increased production of milk per cow, it may simply be said, that at St. Hyacinthe, the recorder in charge of the district is able to compile a roll of honour, including twenty members owning one hundred and one cows that gave in 1915 over 8,100 pounds of milk and 312 pounds of fat; this is an increase of 826 pounds of milk per cow over the yield of 1914. Three years ago such a list was impossible.

The supervisor for the Maritime Provinces, Mr. Harvey Mitchell, writes: "The prospects for cow-testing never looked better; dairymen realize now what it means to them, and our recorders will have all the work they can attend to. New dairy record centres are being asked for."

THE HEALTH OF ANIMALS BRANCH

NOTES

BY DR. F. TORRANCE, VETERINARY DIRECTOR GENERAL

FOOT AND MOUTH DISEASE

THE strenuous campaign against this disease in the United States which was begun on October 16th, 1914, by the Bureau of Animal Industry has reached a successful termination. All federal restrictions have now been removed and the country declared free from this highly contagious disease. Not alone is the Bureau to be congratulated upon the excellent work which has been done in stamping out this, the most extensive outbreak which has yet occurred in America, but Canadians should be grateful that the infection never gained a foothold in this country.

The precautions taken by the Health of Animals Branch to safeguard our interests have occasioned more or less inconvenience and loss to importers and the railway companies, but these inconveniences and losses have been cheerfully borne in view of the immense damage which would have resulted had the disease attacked our flocks and herds.

The restrictions on imports from the State of Illinois will shortly be removed, when the traffic in live stock between the two countries will resume its footing prior to the foot and mouth outbreak.

We are glad also to announce that foot and mouth disease has been eradicated in Great Britain and permits for importation will be issued shortly.

TUBERCULOSIS

Regina has recently made application for federal assistance in the suppression of tuberculosis in the herds

of cattle supplying that city with milk. The preliminary investigation of the dairies has revealed conditions favourable for the operation of the federal regulations, and the inspectors of the Health of Animals Branch are now at work applying the tuberculin test. This is a much larger undertaking than that of Saskatoon, involving the testing of over 4,000 head of cattle.

MANGE AREA

A certain area of the North-west, including the southern portion of Alberta and part of the adjoining portion of Saskatchewan, has been for some time a special mange area under regulations governing the movement of stock and the dipping of infected herds. Sufficient progress has been made in the work of eradication to enable us to still further contract the limits of this area by releasing a portion of the north-eastern border. This area comprises some eighty-five townships, in which no cases of mange have been found during the past year. It is hoped that from time to time the area under restrictions will be further contracted until it is possible entirely to release it from special control.

HOG CHOLERA

The close of the fiscal year is a suitable opportunity for a brief review of the effect of the change made last year in our system of dealing with this disease. We adopted a modified system of using serum in addition to our old method of slaughtering diseased animals, the serum being used to enable us to save large numbers of hogs, which, while ap-

parently healthy, had been exposed to infection and might be expected to develop it sooner or later. Actually diseased hogs are still slaughtered and their carcasses disposed of by burial or cremation as soon as possible.

This system has received a good trial in Ontario and some other parts of Canada during the past season, and has been highly successful. It has enabled us to cut down not only the amount of compensation which

the Department would have been called upon to pay the farmer had all contact hogs been destroyed, but it has also saved the farmer the amount which he would have lost as the difference between the actual value of the hogs destroyed and the amount legally granted as compensation. While it is difficult to give actual figures covering the amount saved, it is a very considerable sum and the system is meeting with the approval of the farmers interested.

MEAT AND CANNED FOODS DIVISION

AMERICAN BACON CURED IN CANADA

IMMENSE quantities of American pork have been imported in bond into Canada, converted into bacon at Canadian establishments and exported to England in the form chiefly of Wiltshire bacon. This traffic has attained enormous proportions and has kept the staff of inspectors extremely busy. It will reassure some anxious enquirers to know that this bacon is not permitted to be labelled "Product of Canada", or to bear any mark to indicate a Canadian origin. Each piece bears the inspection mark of the Bureau of Animal Industry—"U. S. Inspected and Passed." These precautions should protect our Canadian bacon against unfair competition from the American product.

DEDUCTIONS FOR INSPECTION

Statements have been made in various quarters that the packers are deducting one-half of one per cent of the purchase price of hogs in order to cover the cost of inspection. While it is true that it is customary to make this deduction it is entirely erroneous to state that it is for paying the cost of inspection. This is entirely borne by the Government. The packers who have to stand the loss on carcasses condemned for disease have taken this course to place the loss elsewhere and it has

been claimed that this charge is no more than the loss incurred.

In contradiction of this it is claimed that half of one per cent is far too much, and that the farmer is paying twice what is required to cover the loss. The argument derived from the figures published in the annual report of this Branch is to the effect that during the year ending March 31st, 1915, the sum of \$179,906 was deducted by the packers, and that during the same period the number of hogs condemned by the government inspectors was only 4,007. This works out at about \$45 per hog condemned and of course this is rather high even in a year of scarcity.

To be fair in the matter this calculation should include not only the carcasses which are condemned as a whole but the portions of carcasses, which amount to a far greater total than the carcasses alone. These have been so far ignored in calculations of the cost.

The statistics of the Health of Animals Branch do not give the total weight of these portions. They are merely enumerated as so many portions condemned. For the information of the public we might state that the aggregate of these portions, while not exactly known, is greater than the aggregate of the carcasses destroyed.

THE ANIMAL CONTAGIOUS DISEASES ACT

UNDER the provisions of "The Animal Contagious Diseases Act", the Ministerial Order of January 8th, 1916, governing the importation of animals or their products, or of hay, straw, fodder or manure from the State of Illinois,

together with all amendments thereto, is extended for a period of one month from April 8th, 1916.

Dated at Ottawa, this fourth day of April, 1916.

(Sgd.) GEO. F. O. HALLORAN,
Deputy Minister of Agriculture.

THE LIVE STOCK BRANCH

STATEMENT WITH RESPECT TO THE LOAN OF RAMS AND BOARS TO FARMERS' ASSOCIATIONS

BY T. REG. ARKELL, B.S.A., B.Sc., IN CHARGE OF SHEEP DIVISION

THE policy of loaning pure-bred sires to farmers' associations has now been in operation three years. Assistance of this nature is confined to districts where the farmers have difficulty in securing well-bred sires, or are in financial circumstances which restrict their ability to purchase the most suitable type of breeding male. In pursuing this work, it has been the purpose of the branch to limit an association to a single breed and advise persistent use of the original selection. Adherence to this system by societies has already shown results of the greatest benefit in fostering not only a keen desire amongst members to produce a consistent and better class of live stock but in creating, as well, a uniform type within a district. Live stock breeding in Canada has never conformed to any distinctive standard. The farmer would, in

many instances, switch from one type to another radically different without assuring himself whether the change would be advantageous or not. Not infrequently this caused undoubted injury and produced a "higgledy-piggledy" in breeding which was not wholesome. An advance toward the establishment of the community system of breeding, which obtains so satisfactorily in Great Britain, is a direct result of this policy of the branch.

As the following tabulated statement shows, over four hundred rams of all the most prominent breeds were distributed last year. A large decrease from the previous season occurred in the number of boars. This was due to the diminished production of breeding hogs in the western provinces, from which most of the applications for boars had other years been received.

RAMS LOANED TO ASSOCIATIONS OF FARMERS BY THE LIVE STOCK BRANCH, OTTAWA, CORRECTED TO JANUARY 1st, 1916

BREED	P.E.I.			N.S.			N.B.			Que.			Ont.			Man.			Sask.			Alta.			Total		
	'13	'14	'15	'13	'14	'15	'13	'14	'15	'13	'14	'15	'13	'14	'15	'13	'14	'15	'13	'14	'15	'13	'14	'15	'13	'14	'15
Shropshire	28	30	31	19	24	20	6	16	1	18	133	40	2	20	3	2	-	5	1	3	-	12	8	33	88	234	133
Oxford Down	-	17	15	38	58	76	9	1	2	5	30	20	3	4	1	11	3	6	-	1	1	-	1	24	66	115	145
Leicester	-	5	2	-	-	-	-	1	8	8	55	75	16	18	9	-	1	1	2	-	1	-	-	-	26	80	96
Cheviot	4	1	-	4	-	-	-	-	-	-	4	2	-	-	-	-	-	-	-	-	-	-	-	-	8	5	2
South Down	-	-	-	-	3	2	-	1	-	3	6	1	-	-	1	-	-	-	-	-	-	-	-	-	7	13	4
Hampshire.	4	2	-	-	-	-	4	-	2	3	8	18	-	-	-	-	-	-	-	-	-	-	-	-	7	8	20
Lincoln.	-	-	-	-	-	-	-	-	-	3	1	8	-	-	-	-	-	-	-	-	-	-	-	-	3	1	8
Suffolk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	3	-	-	-	-	-	-	3	-	3
Cotswold	-	-	-	-	-	-	-	-	-	-	-	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-	3
Total.	36	55	48	61	85	98	19	19	13	40	237	165	21	43	16	16	4	15	3	4	2	12	9	57	208	456	414

**BOARS LOANED TO ASSOCIATIONS OF FARMERS BY THE LIVE STOCK BRANCH, OTTAWA,
CORRECTED TO JANUARY 1st, 1916**

BREED	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Total
Yorkshire..	'13 '14 '15 — 2 —	'13 '14 '15 3 6 1	'13 '14 '15 3 1 —	'13 '14 '15 29 56 14	'13 '14 '15 8 5 3	'13 '14 '15 5 2 —	'13 '14 '15 12 12 —	'13 '14 '15 11 6 2	'13 '14 '15 — — 2	'13 '14 '15 71 90 22
Berkshire..	5 — 1	1 — —	— 1 —	— 4 1	5 7 2	10 5 —	15 18 —	30 18 1	3 1 1	69 45 6
Poland- China	— — —	— — —	— — —	— — —	1 — —	— — —	— 8 1	— — 2	— — —	1 8 3
Duroc	— — —	— — —	— — —	— — —	— — —	1 — —	3 4 —	9 3 3	1 1 —	14 8 8
Jersey	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —
Chester- White	— — —	3 2 —	— — 1	1 11 11	3 — —	— — —	— — —	— — —	— — —	7 13 12
Tamworth	— — —	— — —	— — —	— 2 1	— — —	— 1 1	— 1 —	1 — —	— — —	1 4 2
Total.	5 2 1	7 8 1	3 2 1	30 69 27	17 12 5	16 8 1	30 43 1	51 22 8	4 2 3	163 168 48

A THOROUGHBRED STALLION FROM THE ROYAL STUD

HIS Majesty the King has presented to the Government of Canada the thoroughbred stallion "Anmer." This horse was selected from His Majesty's stud as one of the most suitable in it

sire was "Florizel II" and his dam "Guinea Hen." The following extract from a communication of the manager of His Majesty's Breeding Stud to the Secretary of the High Commissioner for Canada in London,



**B. H. ANMER, 6 YRS., BY FLORIZEL II.—GUINEA HEN,
Presented to Canada by His Majesty King George V.**

for the siring of remounts. The horse arrived in Canada in the month of March and has been placed under agreement with the Canadian Thoroughbred Horse Society.

"Anmer" was foaled in 1910. His

describes the stallion:

"His sire 'Florizel II' was own brother to 'Persimmon' and 'Diamond Jubilee,' and comes from the late King Edward's celebrated breed, which is even now breaking records every year. ('Diamond Jubilee' easily led the list of winning

stallions in the Argentine last year, and 'Persimmon' was at the head of the list of sires of successful brood mares in this country in 1915).

"Of course, no two people agree about the stamp of horse best suited to breed remounts or hunters, but in my opinion, 'Anmer' is one of the best types of horses for that purpose you could possibly get, and I hope the Minister's opinion will coincide with mine.

"'Anmer' is a very commanding horse, standing about 16-1, combining the maximum of power with the minimum of lumber. He carries himself well, and is wonderfully active for his size. His shoulders are strong, without being heavy, and slope well back to the withers. His girth is good, and his back and loins are as strong as a dray horse's. He stands well on his legs, and he came out of training last November, as a five year old, without a speck or blemish on him, notwithstanding that he had been leading our horses in all their long work, on all sorts of going—hard and soft—for two years, which fact alone is a wonderful tribute to his soundness.

"This was the horse that was thrown down in the Derby of 1913 by a suffragette, who dashed out from under the rails to seize the horse's bridle during the race. The woman was killed, and the horse turned a complete somersault—it

was a miracle the jockey, Herbert Jones, was not killed also."

The stallion has been taken over by the Canadian Thoroughbred Horse Society for a period of one year, or until the 31st of March, 1917. The Society agrees to bear the entire cost and expense of his maintenance, care and keep, including necessary veterinary attention, without any charge to the Government of Canada. He will be mated only with half-bred and thoroughbred mares that are approved by the Canadian Thoroughbred Horse Society and the Dominion Live Stock Commissioner. Service fees have been fixed at fifteen dollars for half-bred mares and fifty dollars for thoroughbred mares. The fees derived from service are to be offered to agricultural shows and exhibitions as premiums for the produce of thoroughbred horses in classes for horses best suited to become remounts. The horse is stationed at Oakville, Ontario.

ASSISTANCE TO WOOL GROWERS' ASSOCIATIONS IN GRADING AND CLASSIFYING WOOL FOR MARKET

BY T. REG. ARKELL, B.S.A., B.Sc., IN CHARGE OF SHEEP DIVISION

APPPLICATIONS for assistance in grading wool have been received this year by the Live Stock Branch from wool growers associations in every province. A most remarkable advance of interest by farmers has occurred all over Canada in their desire to adopt improved methods in preparing and marketing wool.

Grading constitutes one of the most effective means of demonstrating to wool growers the variation in quality and condition which obtains in wool and shows clearly the necessity of observing the utmost cleanliness if a high price is to be attained. A fleece containing an exceeding quantity of extraneous material as

straw or burrs is included in the reject class which sells considerably lower than the first grades. The spirit of emulation, which is created amongst members of associations to produce the highest type of wool, in itself makes grading a valuable and beneficial practice. Besides, purchasers can recognize more readily the character of graded wool and its real value in manufacture and are assured of securing a uniform product. In this way grading serves as a boon to both producers and manufacturers.

Grading, where it is followed in an organized fashion, will be pursued either directly by or under the instruction and superintendency of the

wool experts of the branch. The associations will control and perform the actual collection and disposal of the wool, either through channels devised by themselves, or, in some instances, by means of assistance extended to them by agricultural colleges or provincial departments of agriculture.

The following represents an approximate estimate of the amounts of wool which will be classified this year under the supervision of the Live Stock Branch, together with a statement of the grading points or stations. Grading will commence east of Fort William the first of May and will extend until the first of July; in the western provinces it will not begin before the middle of May and will continue until almost the end of July:

PROVINCE	Grading Station	Estimated Pounds of Wool
Prince Edward Island...	Summerside	75,000
	Charlottetown	50,000
Nova Scotia	Antigonish	60,000
New Brunswick	Sussex	35,000
	Moncton	25,000
Quebec	Shawville	60,000
	Lachute	15,000
	Huntingdon	15,000
	Cowansville	15,000
	Richmond	20,000
	Lennoxville	15,000
	Cookshire	25,000
Ontario. . . .	Manitoulin	
	Island	30,000
Manitoba.	Winnipeg	160,000
	St. Pierre	20,000
	Elkhorn	30,000
Saskatchewan.	Regina	500,000
	Maple Creek	250,000
Alberta.	Walsh	125,000
	Cluny	75,000
	Calgary	250,000
	Lacombe	60,000
	Edmonton	50,000
	Pincher Creek	30,000
	Conrad	300,000
	Chin	400,000
	Formost	300,000
	Innisfail	40,000
	Vermilion	50,000
British Columbia.	Duncan	35,000

THE FRUIT BRANCH

FRUIT MEETINGS

IN conjunction with the Ontario Department of Agriculture, meetings have been held at the following points:

Frankford	March 16th
Picton.	April 5th
Wellington.	" 6th
Trenton.....	" 7th
Iroquois.....	" 13th
Rednersville.	" 18th
Consecon. . . .	" 19th

We were very glad to co-operate in this way with the Provincial Fruit Branch and the results have been most encouraging. All the meetings were well attended and those present were, in every instance,

directly interested in the fruit industry.

The principal subjects under discussion were those relating to production, co-operation and marketing, as these three factors are essential in the production of high-class fruit. Demonstrations in grading were given and addresses were delivered by practical fruit-growers and others.

The following is a list of those who assisted in making these meetings a success:—

D. Johnson, Dominion Fruit Commissioner; P. W. Hodgetts, B.S.A., Director

Ontario Fruit Branch; H. T. Foster, Fruit Growers, Burlington, Ont.; W. F. Kydd, Ontario Fruit Branch; F. C. Hart, B.S.A., Director Ontario Markets Branch; A. P. McVannel, B.S.A., District Representative, Prince Edward County; A. D. McIntosh,

B.S.A., District Representative, Hastings County; C. W. Baxter, Chief Fruit Inspector, Eastern Ontario and Quebec; E. P. Bradt, B.S.A., District Representative, Morrisburg, Ont.

INSPECTION OF SMALL FRUITS

WITH the opening of the small fruit season in June next, special efforts will be made to prevent a repetition of some of the faults in the packing of these fruits which were so evident in 1915. At that time there was a very general complaint regarding (1) the under-filling of baskets and (2) the packing of immature fruit. It will be the duty of the inspectors to visit the growers at the beginning of the picking season and to instruct them in the methods which it will be necessary for them to adopt in order to avoid prosecution under the Inspection and Sale Act. These violations are very often committed through ignorance on the part of the grower, or on the part of those who

have charge of the packing. The inspectors will therefore be instructed to educate these men and to explain to them the necessity of careful supervision of their pickers in the field. The latter are generally young girls and boys who are being paid according to the number of boxes they fill per day, and naturally the tendency is to fill the box regardless of the quality of the fruit. This also will be looked into carefully by the fruit inspectors, and the foreman will be instructed to exercise special care in the packing houses where the boxes are sorted and put into crates.

It is hoped that by making a special effort along this line, the small fruit season of 1916 will be successful in every way.

FRUIT PROSPECTS

THERE is every prospect of a satisfactory production of large fruits in Canada next fall. The trees have come through the winter in fine condition, and from all parts of the Dominion reports indicate that there will be a heavy blossom and that with favourable weather the crop should be well above the average. Frost is reported to have injured the peach and sweet cherry buds in British Columbia and in some fruit districts of the north-western states. No frost injury is reported in Ontario or Eastern Canada.

In view of the fact that the export market is likely to be somewhat

restricted, it may be advisable, as was explained in the April number of THE AGRICULTURAL GAZETTE, for the growers to take some steps to increase home consumption. As the season advances this branch will secure more complete information in this connection and be able to inform the growers more definitely. We would strongly urge these men to take every possible step towards raising the quality of their fruit to a high standard, so that when the marketing season opens there will be no complaints made by the consumers on account of poor quality.

PART II

Provincial Departments of Agriculture

AGRICULTURE IN CANADA

It has been planned to publish in this volume of The Agricultural Gazette an account of the agricultural industry in Canada. The provincial authorities have given their hearty approval of the proposition and have generously agreed to contribute the articles for their respective provinces. The subject is to be taken up under the following heads:-

1. Agricultural lands,
 - (a) Area in use.
 - (b) Area and character unsettled.
2. A brief history of agricultural conditions, their character and development.
3. The most suitable line or lines of agriculture for the province as indicated by character of soil, climate, nearness to market, etc.

In this number the series begins with the province of Nova Scotia. Corresponding articles from other provinces will appear from month to month until the whole Dominion has been covered.

NOVA SCOTIA

BY M. CUMMING, B.A., B.S.A., SECRETARY FOR AGRICULTURE

Area of Nova Scotia	13,483,671 acres
Owned by farmers. . . .	5,260,455 "
In forests.....	5,750,000 "
In barren lands.....	2,276,000 "
Unissued.....	196,116 "

FARMERS' LANDS

Under the plough.....	1,257,459 acres
Pasture land.....	2,002,996 "
<hr/>	
Total cleared.	3,260,455 "
Wood lands.....	2,000,000 "
<hr/>	
Total.....	5,260,455 acres

(Cambrian era) and more or less rocky areas scattered throughout the province. The part which could be, but is not, tilled now is composed mainly of forest area. Until manufacturing and other industries develop sufficiently to give a larger local market, it is better to leave these lands in forests and to centre attention upon the improvement of the already cleared areas.

IT is estimated that 60 per cent of the lands of Nova Scotia, equal to 8,090,000 acres, could be tilled. The remaining 40 per cent is composed for the most part of granitic and slate rock formations which constitute the greater part of the southern half of the province,

HISTORY

Agricultural development of the province commenced at the French colony at Port Royal (now Annapolis) in 1605, from which time until 1755, when the expulsion of the Acadians occurred, practically all the farming

in the province was carried on by the French. It is interesting to note that the first wheat raised and ground in America was at this place. Subsequent to 1755 there were four main lines of settlement:

1. The returned French settlement occupying the coast areas along the Bay of Fundy on the north-western shore of the province and similar coast settlements along the north eastern and south-western shores of Cape Breton.

2. The German settlement of Lunenburg, dating from 1751 (now one of the most loyal and progressive peoples in the province).

Since that time there has not been a large influx of outsiders into the province.

The main lines of settlement as described in the foregoing are for the most part well preserved and easily recognized by anyone who is familiar with the province.

So far as organized agriculture is concerned the most important events were:

1. The letters of Agricola (John Young) published 1818, which paved the way for the development of improved methods of agriculture and for the organization of agricultural societies, which are still a



A NOVA SCOTIA HARVESTING SCENE

3. The settlement from the New England states, beginning about 1760 (following the expulsion of the Acadians) and augmented by the Loyalists, 1775-83. These people settled the vacated lands of the French in the western half of the province as well as various localities along the South Shore and in the east.

4. The colonization from Great Britain, commencing with grants of land given to disbanded regiments (principally Highland) about 1760, whose favourable report brought a further large influx of their countrymen, who continued to come in quite large numbers until about 1830.

prominent feature (now numbering 247) of Nova Scotian agriculture. Twenty-five of these societies were organized by 1820. The King's County Agricultural Society, still in existence, was organized in 1789 (I understand that there is only one agricultural society in America, in the state of Pennsylvania, older than this King's County Society).

2. Organized agriculture and the agricultural societies were placed under the control of the Central Agricultural Society at Halifax in 1819.

3. Control was placed in the hands of a provincial Board of Agriculture in 1864.

4. In 1884, the office of secretary for agriculture was created and the control of these organizations placed under that office.

5. In 1885, a chair of agriculture was established in connection with the provincial Normal College and in 1888 the nucleus of the present Agricultural College property was purchased and the Nova Scotia School of Agriculture, then a faculty of the Normal College, was erected.

6. In 1893 a School of Horticulture was established in Wolfville.

7. In 1905 the School of Horticulture and the School of Agriculture were united into the present College of Agriculture at Truro.

8. The Nova Scotia Fruit Growers' Association, the parliament of the fruit growers of Nova Scotia, was organized in 1861, and the Nova Scotia Farmers' Association, the parliament of the general farmers of the province, was organized in 1895, and the Nova Scotia Dairymen's Association was organized in 1912. These bodies have been pioneer bodies in developing many phases of the agricultural policy of the province.

9. The establishment of the Dominion Experimental Farm at Nappan in 1888 and the establishment of a Dominion Experimental Fruit Station at Kentville in 1910.

AGRICULTURAL ADVANTAGES OF THE PROVINCE

1. Serious droughts never occur and general crop failure is unknown. The annual average precipitation is about 40 inches in comparison with about one-third of that amount in parts of Canada.

2. The temperature is free from extremes. Springs are often delayed and the season, except in parts of the Annapolis Valley, is in general too short and too cool for such crops as corn, peaches, etc. A study of the census tables of the Dominion of Canada shows that the average yield per acre in Nova Scotia surpasses the average yield for the whole Dominion of Canada in hay, roots and potatoes. It compares favourably though falling somewhat lower in cereal crops.

3. No province in the Dominion has better transportation facilities.

4. While the province is in general suited to general farming it has a great asset in the Annapolis Valley, one of the finest fruit farming areas on the continent.

5. Nova Scotia has from 50,000 to 100,000 acres of dyke marsh lands along the Bay of Fundy of extreme fertility.

6. Diversified forms of employment are open to everyone, a matter which militates against the highest development of agri-

culture but ensures a livelihood for everyone.

THE OTHER SIDE OF THE QUESTION

The soils of Nova Scotia are of just average fertility, neither very rich nor yet very poor. The average of some 200 analyses recently made at the College of Agriculture, Truro, indicates amounts of nitrogen, phosphoric acid and potash just about equal to the amount which the late English chemist, Warrington, and the American chemist, Snyder, considered should be found in an average fertile soil. In general the soils are slightly below average in their content of lime and organic matter.

A consideration of all these matters points to the necessity of live stock farming combined with systematic rotation of crops as the right kind of farming for the greater part of the province, for it is this kind of farming that will keep up the organic matter of the soil. While this is the case, however, the fact remains that although the most successful farmers follow this practice, yet in many parts of the province the practice of growing and selling hay especially, and to some extent, other crude products of the farm is carried on to the detriment of the soil.

So far as live stock is concerned the biggest returns are to be made from dairying and from sheep raising. The humid conditions, favouring as they do the growth of grasses and other succulent crops, are especially favourable to these classes of live stock.

Fortunately dairy farming is making progress, a fact well established by the returns of the creameries of the province, which, since the year 1910, have increased their output from 30 to nearly 50 per cent annually. Perhaps even more indicative are the official returns from individual herds under government test, some of which reveal as high as 300 per cent increase in the return in less than a decade.

The matter of dairy development is being actively pushed forward by the College of Agriculture, the whole Department of Agriculture and the recently organized Nova Scotia Dairymen's Association.

Sheep raising, for which the province is equally well suited, has made no such progress as dairying. Between 1871 and 1911 the sheep population of the province, in sympathy with the sheep population of the

Unquestionably, the future of the agriculture of the province lies largely along the line of a development of the dairy industry accompanied by a reasonable development of the other lines which will fit in with that industry.

FRUIT GROWING IN THE PROVINCE

Nova Scotia has a great asset in the so-called Annapolis Valley, which



APPLE-PICKING IN AN ANNAPOLIS VALLEY ORCHARD.

whole Dominion, decreased over 40 per cent. Since that time it has slightly increased, but the increase has not been in any sense commensurate with the possibilities. Beef raising except in the vicinity of the marsh lands has not been and does not promise to be as extensive an industry as the dairy. Hogs are increasing in sympathy with the dairy industry and poultry are increasing both in numbers and productivity.

is really a series of valleys in the north-western half of the province about one hundred miles long by ten miles wide. Here the apple grows to perfection. Besides there are sections of the south shore and local areas elsewhere in the province where fruit growing can also be carried to a high stage of development.

While fruit was grown ever since the early French settlement in the seventeenth century, yet the indus-

try did not begin to make rapid strides until the year 1880, at which time the export of apples was about 20,000 barrels. By 1911, this export had increased to over 1,500,000 barrels, and while there have been off years since then, when fruit production has fallen over 50 per cent, it is held that the ultimate possibilities are very much in excess of the present accomplishment. Apples are the principal fruit exported, but plums and cherries and the hardier varieties of pears all do well. Strawberries and the various small fruits grow to perfection not only in the valley but throughout the whole province. Peaches and grapes are grown only to a limited extent.

The outstanding advantages which the Annapolis Valley fruit-growers possess are:

1. Practically every fruit-grower owns in addition to his orchard fifty or more acres of land just as well suited to general farming as the lands in any other part of

the province. Consequently the fruit farmer may also be a general farmer and can make a living whether fruit sells or not. From the standpoint of economics in the province, the writer hopes that this condition of affairs will always continue to exist, for it ensures ultimate prosperity among the fruit-growers no matter what may happen the fruit markets of the world.

2. Transportation facilities are extremely favourable, no other part of America having easier access to the seaboard and to the overseas' markets of the world.

RESUMÉ

A consideration of the foregoing must reveal to the reader the fact that the Nova Scotian farmer has only made a commencement. His reach far excels his grasp. There are ultimate possibilities as yet undreamed of and it is with respect to the realization of these that the farmers and fruit-growers of the province and the various members of the Department of Agriculture are now bending their very best efforts.

In the last named school (Arnaud) all the children are Ruthenians and the district has not yet been one year in operation, nevertheless this is perhaps one of the best, if not the best, school gardens in the province, in a rural school. It consists of about half an acre and contains hundreds of ash, maple and willow seedlings. Wild cranberries, garden raspberries, and perennial flowers of various kinds are to be found in it. It has a garden plot for each child and a number of experimental plots of wheat, barley, oats and alfalfa.—*School Inspector M. Hall-Jones in Report to the Minister of Education for Manitoba.*

PASTURE CROPS IN THE PRAIRIE PROVINCES

MANITOBA

BY T. J. HARRISON, B.S.A., PROFESSOR OF FIELD HUSBANDRY, MANITOBA AGRICULTURAL COLLEGE

THE future of the live stock industry in the province of Manitoba depends upon the successful solution of a number of problems that are not met with in the older provinces. Among the more important of these is the production of suitable pastures. If this country is to compete in live stock rearing, it must produce pastures that will carry as many head of live stock per acre as the other live stock countries.

The crops that are used for this purpose in the south and east are not hardy or drought-resistant enough for conditions in the west. It, therefore, becomes the duty of the experimental farms and agricultural colleges to discover or develop other crops that will produce just as good pasture and at the same time be adapted to western conditions. Considerable has already been accomplished in the introduction of new crops, but there is still much to be done before Manitoba pastures can be considered perfect.

At the present time the farmers are depending on three distinct types of pastures:

- 1st Wild land pastures
- 2nd Perennial pastures
- 3rd Annual pastures.

WILD LAND PASTURES

In the early days the wild lands furnished all the pasture required. The quality was poor, but, as there was an unlimited range, this made very little difference. The land, however, was too valuable to be long used in this manner. As the country

became more thickly settled these common grazing grounds were broken up and used for the production of wheat. At the present time only wild land that is unfit for cultivation is used for permanent pasture.

PERENNIAL PASTURES

In the production of perennial pastures in this province the grasses have given better results than the legumes, as the latter crops are not sufficiently hardy to stand grazing under the extreme weather conditions. The only place for a legume as a pasture crop, therefore, seems to be in a mixture with some of the grasses. There are a number of cultivated grasses that are adapted to pasture purposes, but only two of these are suited to the soil and climatic conditions of Western Canada. They are Brome and Meadow Fescue. Other grasses such as Western Rye, Timothy and Red Top are sometimes used for this purpose but they are essentially meadow grasses.

GRASSES SUITED TO MANITOBA CONDITIONS

Brome grass is perfectly hardy and produces superior grazing to any of the other grasses. In some districts it has fallen into disfavour because of its stoloniferous habit, which makes its eradication somewhat difficult. The difficulty from this has been greatly exaggerated, however, as there is practically no district in Manitoba where the Brome grass cannot be completely killed out in one year by thorough cultivation. This difficulty is not so marked in the south and west, because the soil is

lighter and the climate drier. In these districts it is used for both hay and pasture. For pasture purposes it has no equal, because it starts early in the spring, grows late in the fall, and remains green during the dry weather in July and August.

Meadow fescue, or English Blue grass, has not been grown extensively in the west, but gives promise of being a good substitute for Brome where the latter is found difficult to eradicate. For this reason it is recommended for the eastern and northern portions of the province. It is somewhat similar to Brome in its nature of growth, producing an abundance of basal leaves and form-

vince. It can be used for hay production in the moister districts, but does not make good pasture unless it is sown in a mixture.

To obtain larger yields per acre and better pasture it is usually better to sow the grasses and clovers in mixtures.

SATISFACTORY PASTURE MIXTURES

The following mixtures have given good results:—

For pasture in the dry districts:

Brome ..	8 lb.
Western rye .	4 “
Alfalfa	4 “



TESTS OF STRAINS OF ALFALFA ON THE MANITOBA AGRICULTURAL COLLEGE FARM, 1915

ing a dense sod because of its stoloniferous habit.

Western Rye grass is perfectly hardy and is sometimes used for pasture, but is not so well adapted for this purpose, as it grows in tufts and does not form a dense sod.

Red Top can be used to good advantage in seeding down a meadow or pasture in a low water run or slough where the water is likely to remain from one to two months during the summer.

Timothy requires considerable moisture and is, therefore, not adapted to climatic conditions in this pro-

For pasture in the moister districts:

Meadow fescue ..	8 lb.
Red clover.	6 “
Timothy	4 “

ANNUAL PASTURES

The perennial pastures will be necessary on every live stock farm, but, if pasture is to be produced economically, they must be largely supplemented with the annual crops. There are three places where this type of pasture must be used if the mixed farmer is to conduct his operations profitably:

- 1st. When the amount of live stock has been increased suddenly and there is not sufficient perennial pasture to carry them all.
- 2nd. When the perennial pastures have failed through winter killing or some other cause.
- 3rd. As a substitute for summer-fallows.

It would seem in the west that this last reason is the greatest justification for the annual pasture. On the average farm a large portion of the land lies idle each year. This land not only does not pay any dividend on the capital invested, but at the same time increases the operating

where we have to contend with persistent perennials such as the sow thistle, the summer-fallow may have to be the method used. The effect on the succeeding crop, and even on the control of the weeds, will depend largely on the crop used for pasture. A crop to be useful as a summer pasture must have certain characteristics of which the following are the most important:

1. It must be able to grow on soil that is in poor condition. This is necessary, for it frequently happens that the land left for this purpose is that which will not produce a profitable crop of wheat.



HARVESTING MINNESOTA No. 13 CORN

expenses, for it must be cultivated; therefore, if it could be utilized for pasture purposes it would not only help to pasture a larger amount of live stock, but would change the summer-fallow from an expensive operation to one of profit. Where experiments have been conducted, the difference in the yield of the succeeding crop between the pasture land and the bare fallow has usually been in favour of the latter, but it is doubtful if the increased yield would offset the loss of the pasture.

The control of the weeds must also be taken into consideration, and,

2. Seed must be cheap, for it must be sown every year.
3. It must make rapid growth, for the pasture is required soon after seeding.
4. The crop must be persistent and not easily killed by grazing, and also have the power to recuperate after being eaten off.
5. The crop must be palatable or the stock will not eat it. This is the objection that is often raised to rape and sweet clover.
6. The crop must leave the land in good condition for the succeeding crop.

The crops that will fill these requirements, and that are adapted to the climatic and soil conditions of the west are not very numerous. For

convenience they may be classified according to the time of the year they are pastured:

1. Late fall pasture crops:
Rape,
Turnips,
Winter rye.
2. Early spring pasture crops:
Winter rye,
Red or sweet clover.
3. Summer pasture crops:
Spring rye,
Oats,
Barley,
Peas,
Millet,
Corn.

often known as a "poverty crop" because of its ability to produce on poor, worn-out soils. While this is true, it will always readily respond to a rich soil and good cultivation. For fall pasture the seed should be sown the last week in August or the first week in September. When to be used as pasture, one and a half to two bushels of seed should be sown per acre. To prevent the stock damaging the roots by tramping and, therefore, increasing the danger of winter killing, the seed should be sown from two and a half to three



PLOUGHING CORN STUBBLE ON THE MANITOBA AGRICULTURAL COLLEGE FARM

EARLY SPRING AND LATE FALL PASTURES

Winter rye.—Among the crops that are suited for cultivation in Manitoba, winter rye is best adapted for the production of early spring and late fall pastures. This is because of its ability to remain green after being frozen. Due to this habit it can be pastured until freeze-up. Under normal weather conditions it will live over winter and renew its growth the following spring, and thus provide good grazing before the grasses have started to grow. It is

inches deep. In normal seasons winter rye should be ready to pasture from four to five weeks after seeding, and if it is not grazed too closely during the fall, it will produce good grazing from the time the land thaws out in the spring until about June 1st. After this the land can be ploughed and cultivated as summer-fallow for the succeeding crop of wheat. If it is not required for pasture as late as June 1st, it may be ploughed earlier and sown to oats or barley.

Rape and turnips.—Rape and tur-

nips can also be used for late pasture because they are little damaged by the fall frosts. They can be sown to best advantage on land that has been summer-fallowed until about July 1st. If the soil is free from weeds it is usually cheaper to sow the seed broadcast. If this is done it will require from three to five pounds of seed per acre. If the land, however, is weedy, it will be better to sow the turnips or rape in drills wide enough to allow for horse cultivation. If sown in this method, less seed will be required. After the crop has been pastured off, the land can be prepared for wheat the following year by discing or ploughing, and

however, greatly increase the cost of seed, and, therefore, if used, should only make up a small portion of the mixture—about two bushels of the cereals and one bushel of peas gives good satisfaction. These crops can be sown any time between May 15th and August 1st. The early sowing gives by far the best pasture. When sown late, however, there is this advantage: the land can be summer-fallowed during the period when weeds give the greatest trouble. The pasture, if sown late, will prevent the soil from drifting during the fall and spring. The following crop of wheat will, in many cases, be better than if sown on a bare fallow because



TESTING CORN PLANTED DIFFERENT DISTANCES APART

while it does not always give as good a yield as summer-fallow or corn land, the loss in yield of wheat would be more than offset by the value of the preceding pasture.

SUMMER PASTURES

Spring rye, oats and barley.—Summer pastures may be made from any of the cereals, but spring rye, oats and barley, seem to give best satisfaction. These can be sown either singly or in mixtures. The mixture can be greatly improved upon by adding some peas. They will,

it will not give such a rank growth.

IMPROVED SQUAW CORN

Theresultsofnumerousexperiments seem to indicate that wheat yields after corn are higher than after a bare fallow. The problem then that confronts the farmer is: how can he grown corn on all the land he intended for fallow? Usually about one quarter of this land will produce sufficient corn for winter feeding. The portion of this land not required for other pasture crops, corn for silage or fodder, can be sown to some early maturing variety of corn for pasture.

Among these varieties of corn there is none better than the improved Squaw corn for this purpose. This gives a fair growth of stem and leaf and also a large quantity of cobs, and, from the results of an experiment conducted at the college this year, it would seem that as a pasture corn would be greatly relished by the stock. The planting should be done some time between the 24th of May and the 1st of July. It should be planted in hills about four feet apart each way. This can be done by using a check row planter, and will require, approximately, from eight to twelve pounds of seed per acre. When planted in this manner the land can be cultivated just as effectively and almost as cheaply as summer-fallow. If the planting is done in June, the crop will usually be ready for pasturing about August 15th, and will produce good pasture until the first killing frost.

To assist the early summer pasture, it would be advisable to sow some leguminous crop like red or

sweet clover with a nurse crop the year previous. This would begin growth about the 15th of May, and could be used for pasture until about July 1st and then ploughed for summer-fallow. By sowing a mixture of red and sweet clover the danger from loss of crop would be small and the ploughing under of this crop would greatly enrich the land. While there is considerable controversy in regard to the palatability of sweet clover, the results from a number of farmers, who are growing this crop in Manitoba, would seem to indicate that it can be pastured, but, even if it cannot, there would be no loss, for, when ploughed under, it would become a valuable fertilizer.

The following outline is given to suggest how eighty acres, which would otherwise be summer-fallowed, could be utilized as summer pasture. It is not maintained that this is perfect, or that any farmer could adopt it without its being modified to suit his conditions:—

PLAN OF ANNUAL PASTURE FOR ALL SUMMER

CROP	Acres	When Pastured
Winter rye	20	"Thaw out" until June 1st.
Sweet clover	10	May 15th to July 15th.
Oats and peas	25	July 1st to September 1st.
Spring rye		
Corn	20	August 15th to October 1st.
Rape	5	September 15th to freeze up.
Winter rye	20	October 1st to freeze up.

SASKATCHEWAN

BY J. BRACKEN, B.S.A., PROFESSOR OF FIELD HUSBANDRY, COLLEGE OF AGRICULTURE, SASKATOON

THERE is every evidence that the increase of soil "drifting", the spread of weeds, and the injury to crops from drought and frost, are not only lowering the acre yield of crops on our western soils but are at the same time seriously increasing the cost of crop production.

To offset or remedy the first two conditions and to lessen the risk of danger from the last two, it seems essential that in many parts of the province two things must be done, (1) replace our one crop system of farming by a more diversified one and (2) introduce more live stock.

Diversification in cropping, and the use of live stock on farms, aid materially in controlling weeds and drifting soils, and in lessening the danger from drought and frost. They do these at a small maintenance cost to the farmer. Of course an initial capital expenditure for fences, buildings and stock is necessary. Tillage, on the other hand, while it helps to control these conditions, does so at a heavy and ever-increasing annual cost.

If we are to grow crops at a profit when "war" prices are a thing of the past we must lower the cost of producing them.

If we are to continue growing profitable crops we must take steps to maintain soil productiveness—in other words, at this time, to control weeds and to prevent soil "drifting."

We can lower the cost of production and control weeds and soil drifting and at the same time build up a safe, sane and permanent agriculture by diversification of crops and the more general use of live stock on our farms.

The purpose of this article is to present some information concerning the suitability of the different hay, pasture, and soiling crops to Saskatchewan conditions.

FORAGE CROPS

In the broadest sense "forage crops" include all crops any portion of which may be used as food for animals. As generally used, however, it does not include the "concentrates" or threshed grains. Forage crops may be subdivided into:

- (1) Hay crops—the small strawed crops that are cured by drying.
- (2) Pasture crops—those harvested by the animals themselves.
- (3) Soiling crops or "green feed"—crops cut green and fed to animals in the fresh succulent condition.
- (4) Root crops—those crops the roots of which are used for animal food.
- (5) Ensilage crops—those preserved in a

succulent condition by the exclusion of air, and

- (6) Fodder crops—the roughage from threshed grains, grasses, and legumes, and from dry cured corn stalks.

PERENNIALS, BIENNIALS OR ANNUALS

Under semi-arid conditions long lived or perennial crops do not yield as well as the shorter lived annuals and biennials. This is explained by the fact that much more frequent opportunity to store moisture and develop plant food is given in the case of annuals and biennials than with a crop which lives several years. At the same time we must keep in mind that perennial crops cost less to produce, since there is no charge for soil preparation, seed or seeding, after the first year.

CULTURE UNDER DRY CONDITIONS

In growing grasses, clovers and alfalfa, there are several practices now quite firmly established in Saskatchewan that differ somewhat from those in vogue in more humid areas. We look upon sowing these small seeds with a nurse crop as precarious in most places having less than 18 inches of precipitation. Yet a thinly seeded nurse crop has considerable value in that it helps to lessen soil drifting, and to smother weeds which may develop before the small plants of the slow starting forage crops get established. But where moisture is the limiting factor in crop yields, a heavy nurse crop instead of being a protection, actually robs the young plants of the moisture necessary for their growth, and often leaves them in such a condition that a severe winter may cause their death.

Drilling, rather than broadcasting the seed, is the general rule. The surface soil is often too dry for good germination and not infrequently high winds are apt to blow away many of the lighter seeds if sown by the "broadcast" method. In a dry climate the moisture conditions ne-

cessary for germination are controlled much better by drilling.

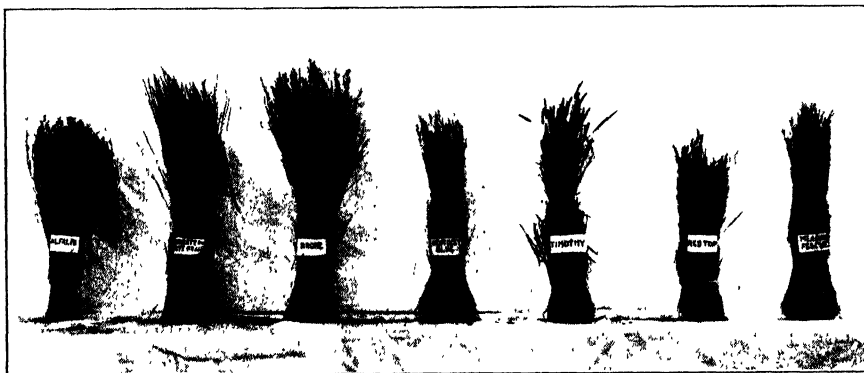
PERENNIAL CROPS

The hay and pasture crops that live longer than two years and that are best suited to Saskatchewan conditions are of two kinds—grasses and legumes. The best grasses are Western Rye grass, Brome grass, Kentucky Blue, Timothy, Red Top and Meadow fescue. The best legume is Alfalfa.

The yields of these at Saskatoon during each of the past four years have been as follows, in pounds per acre:—

NATIVE GRASSES

The native grasses are largely used for hay and pasture in new districts. "Prairie wool" and "sleugh hay" constitute the greater part of the forage used in the early history of prairie farms. When cut before it is ripe, this native vegetation makes nutritious hay, but when allowed to become dead ripe, and particularly after sleugh hay has been frozen, the quality is poor. The native hay usually includes, in addition to numerous grasses, a number of native legumes which increases the protein content of the whole, thus greatly improving it in quality. As long as the



THE PERENNIAL HAY AND PASTURE CROPS IN ORDER OF YIELD AT SASKATOON

PERENNIAL HAY CROPS

VARIETY	1912 lb. per acre	1913 lb. per acre	1914 lb. per acre	1915 lb. per acre	Average lb. per acre
Alfalfa	5847	3037	2985	2384	3563
Western rye grass.	6300	2595	2283	2025	3301
Brome grass.	7400	2032	1733	1733	3234
Kentucky blue grass	3150	2867	390*	1658	2016
Timothy.	2800	1669	1930	1225	1906
Red top.	3700	1766	936	1158	1890
Meadow fescue	3660	1391	726	858	1659

*Poor stand.

From these figures it is apparent that our best perennial crops are Western rye grass, Brome grass and Alfalfa.

supply of native hay is abundant there is usually little need for sowing cultivated perennials. When cut at the right time and properly cured

this hay does not differ essentially in feeding value from that produced from the cultivated grasses.

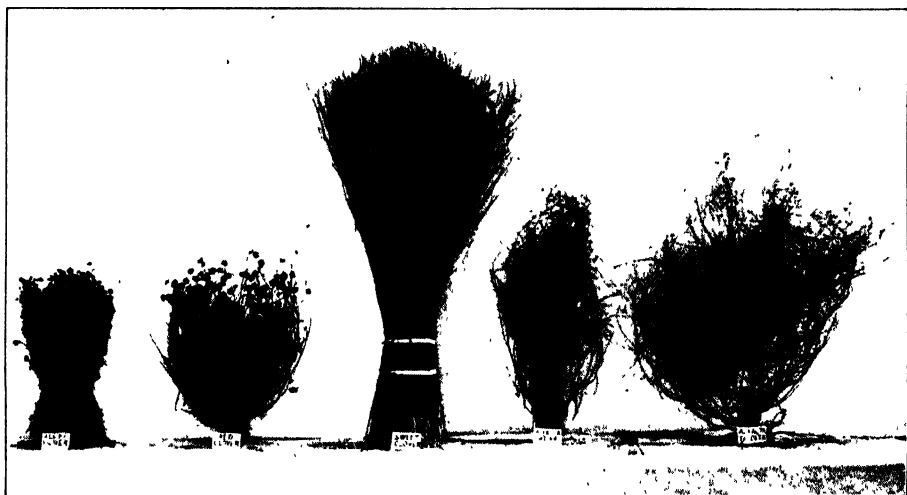
BIENNIAL CROPS

The biennial crops live two years or parts of two years and then die. To this class belong Red clover, Alsike clover, White or Dutch clover, Sweet clover, Winter rye and rape.

The true clovers.—Red, Alsike and White or Dutch—are very little grown in Saskatchewan. They are not well suited to the climate. None of them are drought-resistant, and many strains of red and alsike are

Sweet clover, (*Melilotus Alba*), has several undesirable qualities. It is bitter, coarse, hard to cure, of doubtful value as hay, apt to become an impurity in alfalfa seed, and in waste places may become a weed.

Among the redeeming qualities of Sweet clover are, first, its suitability to the climate; second, its high productiveness; third, its biennial character; fourth, it is a "legume"; fifth, it may be grown as an intertilled crop, and sixth, it does well on light soils that are inclined to drift and where other forage crops often do very poorly.



MATURE PLANTS OF RED CLOVER, COMMON ALFALFA, SIBERIAN ALFALFA AND SHEAVES OF MATURE ALSIKE AND SWEET CLOVER

not hardy enough to live through our winters. Their best use at the present time is to form a small proportion of mixtures for hay and pasture in the more moist parts of the province. White or Dutch clover is hardier and is much used for lawn grass purposes in a mixture with Kentucky Blue grass. Alsike has seemed rather hardier than Red clover with us. White clover is so short that it is unsuitable for hay purposes. It is, however, sometimes used with standard grasses to form permanent pastures.

Sweet clover grows nearly a month before corn is up and generally remains green for a month after corn freezes in the fall. It is seldom seriously injured by spring or fall frosts. It is a crop peculiarly suited to the short growing season and the severe temperature conditions of Western Canada. At Saskatoon, Sweet clover, when sown in rows, has yielded more than any other forage crop, and rather more than corn during the last two seasons.

ANNUAL CROPS

The best annuals for hay, pasture or "green feed" are oats, peas and oats mixed, barley, winter rye, the millets, corn and rape.

Oats in Saskatchewan are used for hay to a greater extent than any of the other cereals. On many wheat farms where native hay is not available, oat hay or oat sheaves and straw furnish the only roughage the working horses receive. For oat hay for horses the crop should be cut in the early dough stage. If to be used for cattle, cutting in the early milk stage is preferable.

popular as oats, but in areas where weeds such as wild oats are troublesome this crop is often used. It ripens earlier than oats and is, therefore, of more value as a cleaning crop. The early varieties can often be cut before wild oats mature enough to drop off. It yields rather less than oats. For forage the early maturing beardless varieties, such as "Success", which is hulled but beardless, and "White Hulless", which is both hulless and beardless, are best.

Winter rye is but little used as a forage crop, although it furnishes earlier pasture and soilage than any



THE MOST COMMONLY USED ANNUAL PASTURE CROPS

Peas and oats. The earlier varieties of peas mixed with the late or standard varieties of oats produce a richer and often a heavier crop than oats alone. This mixture is one of the most valuable for soiling purposes, and it has been ensiled with considerable success at Lacombe, Alberta. It is also used both for hay and pasture. Arthur peas and Banner, Victory or Abundance oats mix well together. The amount of peas used varies from $\frac{1}{2}$ to 1 bushel mixed with 2 bushels of oats

Barley as a hay crop is not so

other crop. It is used to a small extent for hay. Its greatest value as forage is in its earliness. It yields about as much as oats. Many other crops yield a better quality of hay, but none are ready for use as early in the spring. When used for hay, rye must be cut early or the stems become stiff and unpalatable. Western strains of this crop are perfectly hardy if given a reasonable chance. N. D. No. 959 is one of the hardiest varieties.

The Millets are annual grasses that in Western Canada are used only for

forage purposes. They are quick growers, large yielders, drought-resistant, and very sensitive to low temperature. They grow slowly in the cool soil of early spring and are easily killed by fall frosts. They are not popular, for the reason that they are annuals and "warm climate" crops. They are used as "catch crops" or crops to substitute for other forage that promises partial failure. The annual yield on fallowed land at Saskatoon is about equal to that of oats.

Corn (*Zea Mays*) is very little

Flint" and "Longfellow" are among the heaviest yielders. "Free Press", "Gehu" and "Quebec Eight Rowed" are earlier but yield less forage.

In Saskatchewan corn is usually planted about the last ten days in May. Since the young plants are very tender and suffer severely from the lightest frost, the aim is to sow it as soon as possible after danger from spring frosts is past. Rich, warm, loamy soils should be chosen for corn.

Rape (*Brassica Napus*) is a biennial crop that for forage purposes is used as an annual. It is a vigorous grow-



AMONG THE CORN VARIETIES

grown for forage and even less for grain in Western Canada, although for the former purpose it is one of the most important crops we have. Under good management it yields from 8 to 20 tons or more per acre, green weight. It is an excellent soiling crop, is our best silage crop and even its dry cured fodder makes good stock food. The varieties used are chiefly of the flint type, although "North Western Dent" is a favourite and very worthily so. Of the flints, "Compton's Early", "Dakota White

er and gives a large yield of green forage, which is used altogether for soiling or pasture. Yields as low as 10 and as high as 30 tons, green weight, have been secured from fallow land. It is used principally as late summer and early fall pasture for cattle, sheep and hogs. Like turnips it will taint the milk of dairy cattle unless used in small quantity and immediately after milking. Rape will stand quite heavy frost without injury, often giving good pasture until late in the fall.

SOILING CROPS

The soiling crops that are best suited to the climate and soil of Saskatchewan are, in order of their availability for use, winter rye, alfalfa (first cutting), oats or other grain crops, or peas and oats, alfalfa second cutting, corn, and rape. These crops can be made to produce a succession of either green feed or pasture from May 1st to November. The oats, or peas and oats, and rape, may be sown as needed and can be made to provide feed at times when the other crops are not at their best.

Mixtures of Annual Crops for Hay or Pasture.—The most commonly used mixture is peas and oats, but barley and oats, and barley, oats and spring rye, are sometimes grown. The two last mentioned are usually used for pasture purposes only. A very heavy yielding pasture mixture is one made up of peas 60, oats, 34, millet 2 and rape 2. The rape should be omitted if the pasturage is desired for dairy cattle.

SUMMARY

1. The best perennial hay crops for general use in Saskatchewan are Western rye grass, Brome grass and alfalfa, either singly or in combination. The best annual hay crops are oats, peas and oats, beardless barley and winter rye.

2. Crops that are of secondary importance for hay are timothy, Meadow fescue and the millets. Some that may later become useful are the clovers, red and alsike, and possibly sweet clover.

3. The best crops for permanent pasture are Brome grass, or Brome grass and alfalfa mixed. Less productive though useful pasture mixtures are Kentucky Blue grass or Red Top mixed with timothy and alfalfa.

4. The best crops for annual pasture are winter rye, oats, or peas and oats, or oats and barley and rape. Sweet clover, a biennial, may become a useful pasture plant, particularly on light soils.

5. The best soiling crops in the order of their possible readiness for use are winter rye, alfalfa, peas and oats, corn and rape.

We fully concur in the thought expressed on many sides that practically the whole of the rural school studies should be permeated with agricultural principles and lessons; we are constantly preaching the gospel of school gardening and tree planting. In many districts we have been successful in obtaining the co-operation of the parents in the supplying of seeds, etc., and we have a goodly number of schools having garden diaries and science notes, agricultural collections, museums, samples of woods, and collection of birds.—*In Report of School Inspector to the Minister of Education for Manitoba.*

HOME LABOUR-SAVING DEVICES

NEW BRUNSWICK

BY MISS HAZEL E. WINTER, SUPERVISOR OF WOMEN'S INSTITUTES

THE Women's Institutes of New Brunswick are endeavouring to bring about the general adoption of labour-saving schemes by:—

Including in their monthly programmes papers on such topics as "Saving Steps", "Household Conveniences", "Economizing Time and Labour", "A Model Kitchen", "Systematic Housekeeping", "Labour-Saving Devices", etc. These papers are followed by general discussions and demonstrations, productive of much good. Sometimes a member exhibits her own handiwork that her colleagues are anxious to copy.

One of the objects of the Women's Institute is to teach the housekeeper to economize labour. To further introduce labour-savers in the home, the Department of Agriculture at a Provincial Exhibition had a kitchen and dining-room equipped in modern style, when the housewife had an opportunity to examine and see demonstrated several modern labour-savers. At recent exhibitions, although no room has been completely furnished by the department, modern labour-savers have been on exhibition in the In-

stitute booth, and literature on this subject given to interested visitors.

At the Provincial Exhibition held last fall, the Department offered a prize to the member exhibiting the most practical and efficient home-made labour-saving device, household appliance or kitchen utensil. Owing to the limited time for preparation, the exhibits were not numerous but were very commendable. The judges declared the exhibit "Handy Hold-All" the most practical. It was a hand-made bracket containing a number of hooks which held all the little necessities from a memo-pad to a needle-book.

To encourage as much as possible the housekeeper to budget her time and strength, the department has advised the Women's Institutes to make a collection of all available bulletins giving information and showing illustrations on how housework by means of the labour-savers can be made more of a pleasure and less of a drudgery. Also departmental delegates, when visiting the various branches, have given lectures on "labour-saving devices", and whenever possible have illustrated their lectures with especially prepared lantern slides.

MACDONALD COLLEGE

BY MISS FREDERICA CAMPBELL, DEMONSTRATOR FOR WOMEN'S CLUBS

THE question of labour-saving devices is taken up in the Quebec Homemaker's Clubs among other topics of household studies. Government bulletins and helpful magazine articles on this

subject are mailed to the club members to aid them in this work.

There is no doubt that a great many labour-saving devices are not really labour-savers after all and, moreover, what may be a conveni-

ence to one housekeeper may not be considered such by another. Often we hear a good housekeeper remark, "Oh, a breadmixer is of no use to me, I cannot make as good bread with it as I can in the old way". Such a remark simply means that the housekeeper in question has not learned to use the breadmixer. Of course recipes and directions come with the mixer, but flours and yeasts differ and often considerable experimenting is necessary before one can get a perfect result. The housekeeper not accustomed to, and having little time for experimental work, often gives up after one or two trials.

Because we have had neither the time for assistance necessary to doing experimental work on labour-saving devices at the School of Household Science, Macdonald College, we have hesitated to do much recommending along this line.

We believe, however, that a great deal of time and energy may be saved

to the housekeeper by arranging her kitchen furniture and equipment conveniently. A member of the staff of the School of Household Science has done a great deal of work along this line having not only lectured on this subject before the clubs but also sent out instructions and plans of kitchens to those clubs which are taking it up as part of their regular course of study. This is a part of house-keeping which women are beginning to realize has received little attention and that poor management and bad kitchen arrangement is often the cause of the so-called drudgery and lack of time. The woman who has not learned to make the most of what she has on hand will be the one to get the least benefit from the new labour-saving devices.

We hope in time to issue for the use of the clubs a bulletin on, "Good Management in the Home", and, later on, one on "Labour-Saving Devices".

MANITOBA

BY S. T. NEWTON, B.S.A., SUPERINTENDENT EXTENSION SERVICE, MANITOBA AGRICULTURAL COLLEGE

REGARDING home labour-saving devices, we offered this year a valuable prize at the Soil Products' Exposition for the best exhibit of a labour-saving device for the home.

We are also encouraging this phase of the work in connection with the Boys' and Girls' clubs, and at

the present time the Department of Agriculture is considering the advisability of engaging a gas engine expert, who would spend considerable time planning ways and means by which the gas engine could be made to do a considerable part of the heavier work in the farm home.

SASKATCHEWAN

BY MISS ABBIE DE LURY, DIRECTOR OF HOMEMAKERS' CLUBS

WHAT seems to me the most effective plan for familiarising the women of the rural districts with, and acquainting them with, the use of labour-saving devices, is the plan pursued by the

Department of Agriculture at Regina in the Better Farming Train. This train is equipped with a Domestic Science Department which is fitted up with most of the labour-saving utensils, fixtures, etc., that

are within the reach of people in general, and their use illustrated by capable people. It is aimed, more particularly, to demonstrate equipment of the sort that can be fitted up easily at home. A car is also fitted up from the Engineering Department of the University to illustrate the use of the gasoline engine in carrying on not only the labours of the farm, but also a number of the

household labours such as churning and washing.

The women of the Homemakers' clubs devote some time to the preparation of papers and discussions on the subject, and papers of value on the subject are published.

Anything new of the nature that is found to be satisfactory is made known from headquarters to the clubs.

BRITISH COLUMBIA

BY WM. J. BONA VIA, SECRETARY, DEPARTMENT OF AGRICULTURE

THE question of home labour-saving devices in this province was referred to the Advisory Board of Women's Institutes which met recently. Nothing definite has been done with regard to specific means of bringing about the general adoption of labour-saving schemes in the homes, since Bulletin No. 41, by Miss Alice Ravenhill, was issued some three years ago. About 2,000 copies of this bulletin were

distributed to a large number of Women's Institutes. The Advisory Board of Women's Institutes are fully aware of the importance of the subject and intend to have it discussed at the various conferences which will be held during the present year, and it is anticipated that a small exhibit of labour-saving devices will be prepared by the department and shown at the various conferences.

Every penny saved helps You and Your Country.
 Every penny spent unnecessarily helps the enemy.
 Save your money now; later it may save you.
 Some can serve their country by fighting;
 Some can serve their country by working;
 All can serve their country by saving.

—*Agricultural War Book, 1916.*

NOVA SCOTIA

THE INDUSTRIAL FARM SYSTEM

BY E. M. ARMSTRONG, COMMISSIONER OF PUBLIC WORKS AND MINES

THERE is no Industrial Farm, in the strict sense of the term, in Nova Scotia. Farming operations are carried on in connection with a number of the public institutions, but, as a rule, for economic reasons only. At the Nova Scotia hospital, where insane patients only are cared for, the endeavour is made to provide work for patients who are likely to be benefitted by suitable occupation, and the farm and garden are utilized with this object in view. There is no attempt made at systematic instruction, but convalescent patients are encouraged to interest themselves in the various investigations which are being made into the most profitable measures to follow in connection with both crop raising and stock raising. The farm comprises about one hundred acres, and the garden

about four acres, while more than a hundred and fifty acres remain in wood or in pasture. The institution is situated on the eastern side of Halifax Harbour, just outside the town of Dartmouth.

The operations of this farm are watched with interest by many of the farmers who reside within reasonable distance, who may secure the services of the pure bred Clydesdale stallion and Holstein bull belonging to the institution. The pigs which are raised here are also purchased quite extensively for breeding purposes.

The farms being operated in connection with various county asylums have very similar objects in view, but are generally maintained on a less extensive scale. The principal of these are as follows:

NAME OF INSTITUTION	Situation	Acres Under Cultivation	Total Acreage of Property
Cumberland County Asylum..	near Pugwash	175	180
West Hants Industrial Home..	Meander River	100	220
Colchester County Asylum .	near Truro	80	310
Annapolis County Asylum....	near Bridgetown	65	95
Argyle Municipal Home..	Argyle, Yarmouth County	60	460
Halifax County Home . . .	Cole Harbour	60	300
Yarmouth County Asylum. .	Arcadia	50	67
Inverness County Asylum .	Mabou	38	75
Pictou County Asylum..	near Stellarton	35	225
Clare Municipal Home. . .	Meteghan	30	93
East Hants Municipal Home..	South Maitland	30	300
Antigonish County Asylum .	near Antigonish	29	29
Digby County Asylum	Marshalltown	25	70
Richmond County Asylum....	St. Peters	25	65

In connection with the City Prison, Halifax, and the Cape Breton County Gaol, Sydney, minor farming operations are being prosecuted in which the labour of prisoners is utilized, but only for economic reasons. On the other hand, a limited effort is made at instruction in the case of

the small farms connected with two reformatory institutions for boys, the Halifax Industrial School and the St. Patrick's Home for Boys, both situated at Halifax, and also at the Maritime Home for Girls, Truro.

QUEBEC

AGRICULTURAL LEGISLATION

AT the session for 1916 of the Quebec Legislature, recently brought to a conclusion, a very important act was passed providing for the establishment, by certain municipalities, of a compensation fund for the benefit of owners or possessors, for damage done to sheep by dogs. This legislation replaces section XXIIb of chapter second of title eleventh of the Revised Statutes, (articles 5956c to 5956e). The main features of the revision are herewith appended:

"The council of a local municipality must pass a by-law to the effect hereinafter mentioned, if called upon to do so by a petition signed by at least twenty-five of the rate-payers residing in the municipality.

"The by-law shall be passed forthwith at the ordinary meeting next following the receipt of the petition, or at any other ordinary or special meeting, after the giving of the usual notice required by the law governing the municipality.

The by-law shall provide:

a. "For the establishment of an annual compensation fund consisting of the proceeds of an annual tax of one dollar imposed for each dog, and of four dollars for

each bitch kept within the municipality. Upon the production of a certificate from a veterinary surgeon to the effect that a bitch has been spayed, an annual tax of one dollar only shall be exigible from its owner;

b. For the imposition of the above tax payable by the owner or possessor of any dog or bitch kept in the municipality;

c. To compel the owner or possessor of any dog or bitch to declare to the secretary-treasurer of the municipality the number of dogs or bitches under his care, under penalty of a fine of ten dollars recoverable by the municipality for the benefit of the compensation fund;

d. For the appointment of one or more competent assessors, whose duty it shall be to examine, without delay, any sheep which may have been injured by dogs or bitches, and to fix the amount of the damage;

e. For the payment, out of the special fund so created, of compensation equal to two-thirds of the damage done to sheep by dogs or bitches, according to the report of the assessors, provided that the claim of the owner or possessor be made within three months to be reckoned from the date when the damage was caused. Nevertheless the council shall not allow compensation of more than fifteen dollars for any one sheep.

If a sheep is killed or injured while wandering on a public road, its owner shall not be entitled to any indemnity."

Provision is made for the enforcement of this Act and the imposition of penalties in cases of contraventions.

ESTIMATES OF THE EXPENDITURE OF THE PROVINCE OF QUEBEC FOR THE FISCAL YEAR ENDING 30TH JUNE, 1917

Agricultural Societies S.R.Q., 1909, art. 1851	\$100,000
Farmers' Clubs, encouragement of agriculture in general, including subsidy to the South Shore Railway Company, under 63 Vict., chap. 2; land clearing competitions, etc	85,000
The Agricultural and Horticultural Society of Montreal R.S.Q., 1888, Art. 1682 amended, 57 Vic., chap. 20, sec. 1	500
Pomological and Fruit Growing Society of the Province of Quebec R.S.Q., 1909, Art. 1957	500
Horticultural Society, Quebec	500
Council of Agriculture	3,000
Agricultural Schools	30,000
Veterinary Instruction	5,500
Housekeeping Schools	12,000

Dairy Association of the Province of Quebec S.R.Q., 1909, Art. 1958, etc., and O.C. No. 75 of 24th January, 1891	2,000
Dairy School at St-Hyacinthe, and working of farm	8,000
Inspection of dairy products factories, 5 Geo. V. c. 31	60,000
Towards the encouragement of the dairy industry generally	27,000
Encouragement of the cultivation of fruit trees	5,000
Official Laboratory of the Province of Quebec	2,000
Lectures on Agriculture	9,000
Journal of Agriculture	27,000
Encouragement of Poultry Raising	3,000
Provincial Agricultural Merit	3,500
Arbour Day	100
Exhibitions	32,000
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	\$415,600
Civil Government	45,800
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	\$461,400

SUPPLEMENTARY ESTIMATES OF THE EXPENDITURE OF THE PROVINCE FOR THE FISCAL YEAR ENDING THE 30TH JUNE, 1916

Farmers' Clubs, encouragement of agriculture in general, including subsidy to the South Shore Railway Company, under 63 Vict., chap. 2, land clearing competitions, etc	\$20,000
Housekeeping Schools	4,000
Inspection of factories for the manufacture of dairy products, 5 Geo. V, chap 31	28,410
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	\$52,410

BACTERIZED PEAT OR HUMOGEN

BY WILFRID SADLER, B.S.A., N.D.D., BACTERIOLOGY DEPARTMENT, MACDONALD COLLEGE

THE references made by Dr. Frank Shutt to the manurial value of the above material have inferred that before basing too much weight upon the claims of Professor Bottomley much more experimental work requires to be done, and more conclusive results need to be demonstrated. In THE AGRICULTURAL GAZETTE for March, 1914, Dr. Shutt gave an excellent review of the work done on the question of bacterized peat by Professor Bottomley, and in a more recent issue of THE GAZETTE a further note was published to the farmers of Canada. It is not necessary for me to recapitulate the claims made in favour of the treated peat, nor is it incumbent upon me to seek to add to or detract from the observations and criticisms of Dr. Shutt. It may, however, be of some interest to give a brief resumé of the work which for upwards of a year I carried on from

the laboratories of Macdonald College on the bacterization of peat.

Largely as a result of the review published from the pen of Dr. Shutt it was suggested to me by Dr. Harrison, Principal of Macdonald College, that I should undertake some investigational work in the hope of confirming or disproving the contentions advanced by Professor Bottomley. Canada includes large areas of peaty land, and it was obvious that in any experiments conducted here the domestic peat should be used. By the courtesy of Professor Barton, of our Animal Husbandry Department, and of Mr. Ernest V. Moore, of the Canadian Peat Company, Alfred, Ont., I was provided with a supply of the raw material with which to pursue the work. My results have been inconclusive but suggestive; and during the course of the investigation so many points of interest presented themselves that I hope when the op-

portunity presents itself to resume the work.

I met with innumerable difficulties and at the outset had to change very largely the method of procedure which it had been decided to adopt. This was due to the fact that in spite of repeated requests I failed to secure any information whatever from Professor Bottomley regarding the cultures and methods he had used and adopted in his work. The only data upon which I could commence was the report of his first address to the Society of Arts in London. Therein he said: "*by a more or less happy chance it was discovered that certain bacteria possessed the power of converting natural peat into a humated neutral medium,*" such being suitable as a growing medium for the nitrogen-fixing bacteria. It was cultures of these aerobic organisms which I tried without success to obtain from Professor Bottomley. It will be seen that instead of duplicating his work I was forced by necessity to institute a search for suitable organisms by the treatment of which the humating process could be accomplished. After consultation with Dr. Harrison and with Mr. H. S. Hammond, of the Chemistry Department, I commenced a series of preliminary trials, treating peats with various cultures of bacteria in order to convert if possible the humic acids of the peat into soluble humates. In the whole of the trials pot cultures were used and the peat, which arrived at the college in the form of briquettes, had to be first broken up with a large pestle and mortar and then put through a mill. By this means it was reduced to such a state of fineness that it would easily pass through a 2 mm. sieve, while the material prepared for chemical analysis was ground up until it passed through a 1 mm. sieve. The pots used were one foot in diameter, non-porous and of the type generally met with in laboratory experiments. Providing the necessary "controls" I "cropped" the various peats and also at inter-

vals determined quantitatively the chemical composition of the respective lots. It was proposed to estimate the moisture, total nitrogen, available nitrogen, humus and ash. The usual methods for the determination of available nitrogen proved to be unsuitable for peat, and in the event of a resumption of the work some suggestions offered by Dr. Lohnis, of the Washington Soil Laboratories, will be adopted. Among the cultures used in the attempt to bring about "humation" were soil mixtures, soil solutions, manure solutions and sewage solutions. Neither the crops used nor the chemical analyses showed any appreciable change to be taking place in the peats. I then obtained from Dr. Karl Kellerman, Chief Plant Pathologist at Washington, a number of pure cultures of cellulose-destroying bacteria and commenced a further series of trials. The results were again inconclusive.

It seemed useless to attempt the second phase of the work—the heating of the peat and the inoculating with nitrogen-fixing bacteria—until the humating of the preliminary process had been successfully demonstrated. The whole question, however, appeared to be so complicated that I decided to proceed. Professor Dan. Jones, of the Ontario Agricultural College, Guelph, and Dr. Winslow of the Natural History Museum, New York, were good enough to send me several cultures of *Azotobacter*. Having sterilized the peat previously treated with the cellulose-destroying bacteria I inoculated heavily with cultures of the *Azotobacter*. After incubation for 14 days this inoculated peat and water extracts of the same were respectively used as fertilizers for radishes in flat boxes—and for fuchsias and coleus in pots. The results obtained subsequently by weighing the radishes and as demonstrated by photographs of all the experimental plants, were not sufficiently definite to warrant any conclusions being drawn. It may be that one possible explanation of the failure

to obtain definite results in one direction or the other is due to the presence of toxic products in the peat, a point which has received the attention of Robinson of the Michigan Agricultural College, East Lansing. It may be that the types of organisms used for the humating process had not been suitable and that therefore the *Azotobacter* had not had such conditions as would enable them to fulfil their mission. In the absence, however, of any information from Professor Bottomley as to the varieties of organisms he used, and as to the reaction and nature of the peat, it is not surprising that the preliminary work proved abortive. In spite of this apparent failure, however, recent work emanating from the laboratories at the Wisconsin University seems to suggest that in my later trials with the cellulose-destroying bacteria obtained from Dr. Kellerman, I had in all probability initiated at last a line of procedure which promises some degree of success; and moreover, that I had been nearer than seemed possible to a solution of the humating process. At Wisconsin, Mr. Primm, of the Bacteriology Department, has isolated bacteria in pure culture which bring about the digestion of plant fibre or cellulose, and in connection with the work the statement is made that it is only after the digestion of cellulose by suitable bacteria that the nitrogen-fixing bacteria of the air can assimilate the cellulose as food and use it as a derivative of energy.

Later publications of Professor

Bottomley point to the fact that the good effects he had obtained could hardly be secured solely as a result of the actual amount of peat used as a fertilizer. He recounts that owing to the action of micro-organisms on peat—bringing about his so-called humating process—certain stimulating substances are produced; such substances being, according to Rosenheim, probably similar in nature to the accessory food bodies associated with animal growth and nutrition.

In concluding I feel that while from the point of view of practical application my work has been unsuccessful, it has not been without its value. One cannot but emphasize that failing to obtain strains of the original cultures of bacteria there can be no analogy in the work done by Bottomley and in my experiments. Duplication being impossible in the true sense it will be evident that no conclusions as to the reliability of the claims adduced can be legitimately drawn. My work has, however, with the attendant literature demonstrated the difficulties and intricacies of the problems involved, and it has provided a basis for further investigation. The whole question is nevertheless, as stated by Dr. Shutt, in the experimental stage; and while I am inclined to the opinion that there may be possibilities in the use of peat or some derivatives of peat as a fertilizer, the only wise plan is to wait for further data and confirmatory results both from the laboratory and from field trials.

The Japanese are after South African wool and tops and they are after it in large quantities. As yet there are not more than 50,000 sheep in the Nipponese Empire. The Japanese weavers are not worrying about the home supply. They've got the money and their government subsidizes their business and they're quietly preparing to grab a big chunk of the world's textile trade, and believe us, they are going to get it. The party is near sighted who cannot see how Japan will out-textile England, France and Germany.—*American Sheep Breeder.*

ONTARIO

BOARDS OF AGRICULTURE

THE Institutes Branch of the Ontario Department of Agriculture has recently published the Act, Rules and Regulations governing the establishment of Boards of Agriculture, in Manitoulin and all the Ontario south and east of Muskoka and Parry Sound.

RULES AND REGULATIONS

The rules and regulations as approved by the Lieutenant-Governor-in-Council are as follows:

Every Board of Agriculture shall be entitled to receive such money out of the unappropriated funds in the hands of the Provincial Treasurer as the Legislature may grant, provided:--

- (a) That the number of members is at least fifty, each paying an annual fee of not less than 25 cents.
- (b) In addition to the annual meeting, each Board shall hold at least four meetings each year at which papers shall be read or addresses delivered on topics relating to agriculture.
- (c) That the rules or regulations approved by the Lieutenant-Governor-in-Council have been carefully observed.
- (d) That all reports or returns required to be made to the Superintendent have been made to the satisfaction of the Minister.

OBJECTS

The object of each Board of Agriculture shall be the dissemination of agricultural knowledge in its district, the development of local talent, to encourage the formation of farmers' clubs and to render them assistance, to encourage agricultural co-operation, to secure the co-operation of all agricultural organizations, women's institutes, and representative men in the municipalities concerned in plan-

ning for and holding meetings and short courses in the interests of agriculture, home-making and community improvement, at which demonstrations, lectures and discussions will be featured, to forward the interests of the district agriculturally, socially and educationally, in all legitimate ways, to stimulate a more general co-operation among the farmers' clubs, women's institutes, and other agricultural organizations, and to hold a general rally of the farmers of the district and their families at least once a year. The officers shall endeavour to bring the rank and file of the farmers into touch with the most successful local men, that the masses may become more conversant with the best and most profitable methods of farming, stock raising, dairying, fruit culture, and all activities connected with the industry of agriculture. The Board will be expected to co-operate with the District Representative in the various features of work under his direction.

ORGANIZATION AND MEMBERSHIP

One Board of Agriculture may be formed in each district, for which purpose the portion of the province affected is divided into 83 districts.

The membership shall terminate the 31st of December of each year; each member will be entitled to literature published by the Department for general distribution.

FINANCES AND EXPENDITURE OF FUNDS

The revenue of the Board shall be derived from membership fees, grants from the county or municipal councils, legislative grants, the holding of excursions, contributions, etc.

The Department of Agriculture will make grants as follows:—\$25 to each Board which receives a similar amount from municipal or county councils, and an additional sum, equal to one-half of the amount received in municipal or county grants above \$25. No Board shall, however, receive more than \$50 as a legislative grant on account of any one year.

The funds of the institute treasury shall be transferred to the officers of the Board of Agriculture.

All money received, whether as members' fees, legislative grant, grant from the county councils or from municipalities, or otherwise, shall be spent within the district in which the Board operates: (1) To defray actual expenses of meetings; (2) To employ and pay expenses of suitable persons to address said meetings; (3) To assist in circulating agricultural, horticultural, live stock, and dairy literature or periodicals among the members, or to establish a circulating agricultural library for the use of members; (4) To remunerate the secretary and others for services rendered and to cover travelling expenses.

OFFICERS

The Board of Directors shall consist of:

- (a) Two representatives from each farmers' club and junior farmers' association.
- (b) One representative from each agricultural society.
- (c) One representative from each township.
- (d) District Representative of the Department of Agriculture.
- (e) Three representatives from the district women's institute.
- (f) The president, vice-president and secretary-treasurer of the farmers' institute for the previous year; and in succeeding years the ex-president and ex-vice-president of the preceding year will be directors.
- (g) The Board will have power to add to its numbers and when doing so is advised to consider co-operative

societies, granges and other agricultural organizations, as well as boards of trade and publicity associations.

The Board of Directors at their first meeting elect from their number by ballot a president, vice-president, and two to four directors to act on the executive committee, which shall also include the secretary of the women's institute and the District Representative.

The Department of Agriculture under the new Act will be more liberal than heretofore in sending speakers to address meetings of various kinds and to give instruction at short courses. The conditions under which Boards of Agriculture will receive such assistance are thus outlined:—

A speaker or speakers will be sent to meetings upon condition that the Board will provide a suitable hall in which to hold each meeting, and will thoroughly advertise the meetings in accordance with plans outlined by the Department. Short Courses will be held under the direction of the District Representative, who will co-operate with the officers of the Board and the directors in the immediate locality. The officers and directors concerned will be expected to assist the representatives in securing stock for short course work at a minimum of cost. In districts where a representative of the Department is not stationed, the Department will arrange directly with the executive committee of the Board for the holding of short courses. All requests for speakers to attend Board meetings in the district shall come from the executive committee of the Board of Agriculture for the district. The Board will be expected to encourage the holding of meetings by farmers' clubs and other agricultural organizations at which only local talent will be utilized.

A copy of each poster and each programme shall be sent as soon as published to the Superintendent, and to each speaker advertised.

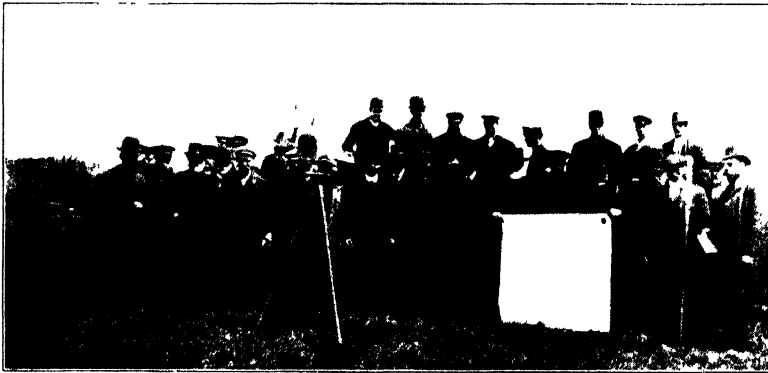
DRAINAGE WORK FOR 1916

BY J. R. SPRY, B.S.A., IN CHARGE OF DRAINAGE WORK, O. A. C.

DURING the season of 1916 drainage demonstration work will be conducted along three different lines, firstly: demonstrating drainage methods to the individual farmer by means of work done on his own farm. Secondly: demonstrating drainage methods by means of field meetings to which are invited the immediate neighbours of the farmer on whose farm the demonstration is held. Thirdly: demonstrating methods and economic value of drainage to the community by means of drainage plots.

this work for the coming season.

During the past seven years nearly five hundred field meetings have been held, with an average attendance of twenty. This work to which one man will give a part of his time will be a feature of our campaign. These meetings are usually held in conjunction with the survey work just outlined. A general discussion of drainage methods is given. Drainage surveying and drainage records are explained and methods of installation demonstrated. Where drainage is being introduced co-



FARM DRAINAGE DEMONSTRATION IN DURHAM COUNTY, ONTARIO
The use of the home-made level, the spirit level and field map is here made clear by actual work.

Demonstrating to the individual farmer is accomplished by sending to him upon application a drainage surveyor. This surveyor furnishes the applicant with information regarding the location of drains, their size, depth, grade, and the many other details necessary to drainage installation. The farmer is shown how to take levels using home-made instruments, how to set grade lines and how to solve the difficulties anticipated in his particular drainage problem.

Since 1905 over 2,000 farmers have been given this personal instruction. Eight men will be engaged in

operation of the various farm owners is frequently necessary and this form of demonstration aims to create a community interest in drainage work.

Drainage demonstration plots will also be a feature of the summer's campaign. Demonstration by this method has proved to be of value. The plan followed is to install plots in districts where drainage is little practised. The plots are located along well-travelled roads and on soil representative of the prevailing soil type of the locality. They are about ten acres in extent, one half being drained and the remainder left un-

drained; large notice boards indicate the drained and undrained portions. These plots remain under the general direction of the Department for three years.

of 1916 two men and a traction ditcher will be engaged in the installation of other plots.

In the future changes may be found necessary due to information



DEMONSTRATING THE USEFULNESS OF THE TRACTION DITCHER ON AN ONTARIO FARM

Up to the present twenty-five plots representing thirteen counties have been installed. During the season

secured through the soil survey work, but the foregoing outline will be closely followed during 1916.

LIVE STOCK SHORT COURSES, 1915-16

BY GEO. A. PUTNAM, B.S.A., SUPERINTENDENT OF INSTITUTES

THE Institutes Branch, Department of Agriculture, co-operated with thirty-three District Representatives in holding demonstrations in the judging of live stock during the winter months. Some fear was anticipated last fall, owing to the part Canada was taking in the present European war, and the much-lamented shortage of labour available for Ontario's farms, that farmers would be so busy caring for their stock that few would be able to take advantage of these highly-educative two-day courses. Besides, this

branch of the Department of Agriculture ran a car of live stock with its Better Farming Special over the Ontario lines of the Canadian Pacific Railway last fall, and live stock lectures and demonstrations were given at each station at which the train stopped. It was thought that the demand for live stock short courses might be lessened on this account, but there has been a greater demand for these courses and the attendance was larger than in the year 1914-15.

During the season, 1915-16, sev-

enty-nine courses were held, occupying one hundred and fifty days. Besides there were nineteen evening meetings held in conjunction with the courses. The total attendance at these courses was, approximately, 12,250. The classes of stock, discussed by eighteen carefully-selected, experienced live stock experts, were: heavy and light horses, beef and dairy cattle, sheep, swine and poultry. In addition to the live stock discussions, seed judging was taken up by a qualified agronomy expert at several of the courses. All evening meetings, attended by mixed audiences, were devoted to discussions of live stock and other agricultural topics, while in many cases these meetings were also addressed by one

of the many first-class women's institute speakers.

The stock used for demonstrating at these courses was secured from local breeders and importers. In a very few localities the standard of the stock was so low that it was impossible to secure animals that could be used to advantage by the demonstrators. At these few places, the only information of value those who attended could obtain was from the lectures given by those in charge. However, in most sections of Ontario really good stock was available and was used to point out to those in attendance the correct conformation of our classes of live stock and to stimulate a desire for still greater improvement in live stock breeding and feeding methods in Ontario.

SUMMER SERIES OF WOMEN'S INSTITUTE MEETINGS

IT has been customary for a number of years to offer the services of a lecturer to each of the Women's Institutes between May 25th and the 7th or 8th of July. Plans have been completed for nearly 850 such meetings to be held this summer. The staff of thirty lecturers engaged for this work met in conference about the middle of April with a view to deciding upon ways and means whereby the meetings can be made of great-

est benefit. Red Cross work in which the Institutes have been so active for the last year and a half was emphasized. "Thrift" as applied to the choice and preparation of food, clothing, household management, was considered. The possibilities of the women in the rural districts giving some assistance by way of keeping up production was also discussed.

NOTES FROM DISTRICT REPRESENTATIVES

HALDIMAND COUNTY

Geo. L. Woltz, B.S.A.:—

"On Tuesday evening I went to Nanticoke to address a meeting of the Farmers' Club upon the subject of 'Soils and Soil Cultivation,' after which a discussion followed. Although the membership of this club is small, they have the right idea. Last year one of the members tried to produce his own seed of White Cap Yellow Dent corn. At this meeting he showed those present

the results of a germination test of this seed which averaged 92 per cent strong germination. This brought up a new discussion on the advantages of seed testing, after which several farmers intimated that they were going to test every ear of corn before planting, in order that they would get a good strong stand. As a result of the variety test we placed in the county last year, the club's order is for Golden Glow corn this spring, as the White Cap they ordered last year footed the list in our test."

GRENVILLE COUNTY

J. E. McRostie, B.S.A.:—

"The plan I have adopted this year to govern the supply of material to be grown at home by pupils is as follows: Material will be supplied by the Department free of charge to allow the pupils in each school to have one plot each, but each class is limited to five plots of one variety, this would allow thirty plots for each school, which I think is sufficient. I explained to the pupils of the schools that our supply of material was limited and that limiting the number of plots to the different varieties was simply to prevent the run of any one class of seed. As the applications come in from the various schools I note that this limitation of not more than five applications for any one crop is having the desired effect, of equalizing the number of plots of each crop in the different school districts."

GREY COUNTY

H. C. Duff, B.S.A.:—

"On Friday evening we assisted a special committee appointed by the Markdale Agricultural Society to revise the prize list. We have assisted in this work every year since coming to Grey and always find that considerable improvement can be made. In order to encourage some of the boys of this district to enter the Baby Beef competition and also to send animals to the Winter Fair in order to compete for the county prizes as well as for some of the general prizes, a special class was added to the list for fat steers two years old or under. The animals must be highly finished before the full amount of prize money will be awarded. The first prize will be \$10 and the second \$6. A special prize was also decided upon for the best pen of lambs, three, any breed, grade or cross. Numerous other changes were also made very largely for the purpose of interesting the boys in the work of the society. The idea is to get the boys who are leaving school now to take as much interest in the fall fair competitions as they did in the school fair competitions."

DUNDAS COUNTY

E. P. Bradt, B.S.A.:—

"I am arranging to co-operate with the Reeves of some of the villages in the county in getting together a list of young men in

those particular villages who have not steady occupation and who possibly would be available for work on the farm. There are a number of such young men in all the villages in the county and I think by putting the question to them fairly that they would see that their duty at the present time is either to fight or to help produce. As the spring advances the need for a supply of help on the farm becomes more evident."

SIMCOE COUNTY

J. Laughland, B.S.A.:—

"Our appeal to the retired farmers living in towns and villages in the county is being pushed vigorously and is proving that there are a great many men still capable of doing a good deal of work who are not fully employed and might take the place of an active young man so that he could go to the front. We wrote to different persons in each town and village asking for lists of retired farmers and although only a few of the smaller places have been heard from, we have 114 names."

LAMBTON COUNTY

G. G. Bramhill, B.S.A.:—

"On Wednesday evening of this week there was held in Petrolia a Get-Together banquet of the breeders of pure bred live stock in Lambton county. The invitations for this banquet were sent out from this office, having the approval of a convention committee of leading breeders in this district; the banquet far exceeded our expectations. There were 70 farmers assembled around the table and a Get-Together spirit pervaded the whole gathering. The speakers of the evening were: J. H. Grisdale, Director Dominion Experimental Farms, and Wade Toole, Editor of the *Farmers' Advocate*. At the close of the meeting a resolution was drawn up that an association be formed in Lambton county to be known as the Lambton County Live Stock Breeders' Association and the convention committee was appointed to perfect the organization. The objects of this association will be to further the interests of the pure bred breeders and to elevate the whole status of the live stock industry of the county. It is also proposed to have an annual dispersion sale and, when finances warrant it, a winter fair will be held."

MANITOBA

ALFALFA HYBRIDIZATION

ATTEMPT TO IMPROVE SEED PRODUCTION IN ALFALFA BY CROSSING WITH BLACK MEDICK AND SWEET CLOVER

BY WILLIAM SOUTHWORTH, MS. AGR., F.L.S., AGROSTOLOGIST, MANITOBA AGRICULTURAL
COLLEGE

AS a forage crop, alfalfa possesses many good qualities and also some serious defects.

One noticeable defect is its inability, under certain conditions, to produce an adequate supply of seed.

To try and overcome this shy seeding habit investigations, conducted by the writer, have been in progress, during the past four years, and the present paper is a brief resumé of what has been done.

Carefully conducted preliminary tests showed that this scarcity of seed production in alfalfa is due, at least in some districts, to the fact that if alfalfa flowers are not fertilized, either by artificial means or by suitable insects, no seed is produced. A certain species of wild bee has been found to be most effective in bringing about this fertilization; hence a deficiency of these desirable bees is followed by a poor yield of seed.*

WORK WITH BLACK MEDICK

In contrast with this lack of good seeding properties in alfalfa there are certain wild leguminous plants which are well known to be most prolific seed producers. One of these is the common Black Medick, also known as Yellow Trefoil (*Medicago lupulina*).

Experiments with this plant indicated that no matter whether the flowers are exposed to the influence of bees or enclosed in such a way as

to exclude bees, an abundant yield of seed is produced. This means that the flowers of Black Medick possess the power to fertilize themselves automatically.

It will be readily understood that this property of automatic fertilization and prolific seed production is of immense importance in enabling Black Medick to spread rapidly; and if such a characteristic could be transmitted to alfalfa, it would greatly enhance its value as a forage crop by enabling farmers to increase their areas of forage at a much more rapid rate.

With this in view it was decided to test whether or not it is possible by cross fertilization to transmit to alfalfa the free seeding properties of Black Medick.

Work was commenced in the season of 1911.

In making the cross, alfalfa was used as the female, or seed producing parent, and Black Medick as the male, or pollen producer.

After considerable difficulty and repeated failures, five cross-bred seed pods were obtained, each pod containing several good seeds.

In 1912 these seeds were sown and twenty-four hybrid plants raised, most of which produced a small amount of seed the following year.

The seed from the first generation hybrids was sown in 1914 and 1915. In all several hundred plants were raised.

During the summer of 1915 these second generation plants were care-

*For details see *Journal of Heredity*, Vol. 5, October, 1914.

fully studied, but, as they had not been planted for a sufficient length of time for the various characteristics to become fully developed, a detailed examination of their individual peculiarities at the present stage will not be attempted. It may be said, however, that plants were found having a general similarity to the grand-parents, alfalfa and Black Medick. Others showed intermediate characteristics, but the plants, as a whole, had a much greater resemblance to alfalfa than Black Medick.

With respect to seed production, these hybrids of the first generation produced a very small amount of seed, two plants being almost sterile.

This tendency to sterility is a condition usually found in first generation hybrids between different species, and it is in the second, and subsequent generations, where we must look for plants to appear possessing the good seeding properties of one of the grand-parents.

EXPERIMENTS WITH SWEET CLOVER

In addition to the work with alfalfa and Black Medick, hybridization experiments were commenced

with sweet clover (*Melilotus Alba*).

This plant has several outstanding peculiarities; one being the ability to produce an abundant crop of seed even under adverse circumstances. When tested under control conditions, it was found that flowers of Sweet clover, like Black Medick, will produce seed even when bees and other insects are excluded. Having already explained that it is this free seeding habit we are anxious to transmit to alfalfa, the object in wishing to obtain a cross between alfalfa and Sweet clover will at once be quite evident.

During the season of 1913, a total of seventy-seven crosses were made; alfalfa being used as the female parent and Sweet clover as the male parent. In all, ten pods were obtained, but, as not one of the seeds developed a mature embryo, they all proved to be sterile.

However, in the same season we were fortunate enough to try the effect of crossing Sweet clover on one of the hybrid plants (Alfalfa x Black Medick).

The complete scheme of crossing will be readily understood from the accompanying diagram:—

*Alfalfa † X ‡ Black Medick.

HYBRID

Alfalfa X Black Medick † X ‡ Sweet Clover.

MULTIPLE HYBRID

Alfalfa : Black Medick : Sweet Clover.

*† Indicates female or seed producing parent; ‡ indicates male or pollen producing parent.

As a result of the fourteen crosses made, two pods were obtained from which, in the season of 1914, five plants were raised. These we have termed multiple hybrids.

In the following year these five first generation hybrids presented striking variations in flower colour, varying from sulphur yellow to violet purple; these colours having been brought in by the hybrid female parent (Alfalfa x Black Medick.)

All the plants were alike in having

a decumbent habit of growth, and in the stems being exceedingly hard, woody and quite brittle, breaking very easily with a clean fracture.

As regards seed production, four of the plants each produced a few seeds, but the fifth plant appeared to be totally sterile, and, though it flowered profusely, could not be induced to set seed, either by self-pollination or cross-pollination.

With these multiple hybrids, as with the hybrids (Alfalfa x Black Medick), it will be necessary to pro-

ceed to raise second, third, and possibly later generations, so as to have a good opportunity of seeing whether the type of plant will appear which possesses a combination of the good qualities of both original ancestors.

In addition to the work of trying to isolate the type of plant we require by continuous breeding and selection from the first cross, tests are being conducted to try and overcome sterility in hybrids by crossing back repeatedly to the original parental forms.

It is hoped that from either one or the other of these lines of research, results will be obtained not only of direct economic value in the improvement of alfalfa, but also such as may serve to throw light on some of the intricate problems with which a plant breeder has to grapple.

NOTE.—The experiments described in this article were conducted at the Ontario Agricultural College and are to be continued at the Manitoba Agricultural College.—THE EDITOR.

NOTES

POPULAR AGRICULTURAL POSTERS

The extension Service of the Manitoba Agricultural College and the Manitoba Department of Agriculture will co-operate this season in the publishing of a series of posters that will be hung in public places in every corner of Manitoba where farmers are likely to gather. The first poster, written by the Field Department of the College, deals with the question of better seed, treating grain with formalin, weed control and similar topics. The poster is well illustrated

and has been mailed to almost every rural hardware merchant and druggist in Manitoba, it being felt that these dealers, because they handle formalin and bluestone, will be especially interested in displaying the information properly. After the first issue of the poster was distributed, the Department received so many requests for additional copies that a second press run had to be made. Other posters on timely copies will follow at frequent intervals.

AGRICULTURAL INSTRUCTION AMONG NON-ENGLISH PEOPLE

One of the most difficult, and yet one of the most necessary, forms of agricultural extension in Manitoba is that among the non-English speaking people. Hon. Mr. Winkler is fully alive to the need for more instructors and an enlarged propaganda in this direction, and intends from time to time to see that the service of the Department of Agriculture is made more available to the non-English communities.

One member of the Department's staff who has been working continuously among the Ruthenian people, writing in a recent letter, says: "After a successful tour of the Ruthenian colony along the east side of

the Riding Mountains, I am going north to Ethelbert. The shipping of cream to creameries last year has created a keen interest in that form of dairying. We have had lively discussions on increasing the profits and improving the quality of the cream and butter. We are going to receive a lot of cream from these colonies this year. This will demand that a lot of educational work be done through the creameries and among the people during the coming spring and summer. At the creameries we can ascertain who require help, and, in order that we may have the desired quality in the cream, we must go directly to the producers and

instruct those who need help."

In Manitoba there are several large settlements of non-English

speaking people where there is a great field for sympathetic and well directed agricultural instruction.

MORE DISTRICT REPRESENTATIVES

The work done during the past year by the District Representatives who have been operating in certain parts of Manitoba has been so satisfactory that the number has just been increased by four new appointments. Mr. W. R. Roberts has been assigned to the Birtle district; J. H. Hudson to the Swan River Valley; J. R. Bell to the Portage la Prairie district, and J. Sigfusson to Arborg, where he will succeed H. F. Danielson, who has enlisted.

These young men are all of this year's graduating class at the Manitoba Agricultural College, and all had practical experience in Manitoba farm life before taking up their college studies. The District Representatives are under the direction of the Extension Service of the Agricultural College.

Two of the other members of this year's graduating class have been given positions in the College service. These are Mr. F. F. Parkinson, of Roland, who will be assistant in the Extension Service, and Mr. F. H. Newcombe, of Deloraine, who is

temporarily appointed as lecturer in animal husbandry.

One of the lines of work in which the Manitoba District Representatives will be active this year is the encouragement of gopher destruction. Large quantities of gopher poison will be distributed through their offices to farmers who will use it.

Two new dairy demonstrators have been appointed to aid in the work among the Ruthenian farmers of Manitoba. These are Messrs. F. T. Boresky and A. Skorobohacz, both able to speak the Ruthenian language and both students of the Manitoba Agricultural College.

During the coming summer the Manitoba Agricultural College will give demonstrations in some of the towns of the province in syringing shade trees for the destruction of insect pests.

Miss Hazel Sterns has been appointed Supervisor of Women's Institutes in Prince Edward Island, in place of Mrs. A. E. Dunbrack, who has resigned.

SASKATCHEWAN

NOXIOUS WEEDS

CIRCULARS have been sent from the provincial Department of Agriculture, addressed to secretaries of rural and urban municipalities, directing attention to the amendments to The Noxious Weeds' Act adopted at the recent session of the legislature, calling for the appointment of an inspector to enforce the provisions of the Act, by every municipality, each member of which would subject himself to a fine of \$25 if such officer were not appointed. The appointment in succeeding years must be made before March 1st, but this year the time limit was made April 15th. The Provincial Weeds' Commissioner has to be advised immediately the appointment has been made.

Hon. W. R. Motherwell has arranged for the appointment of six Field Representatives of the Weeds and Seed Branch of the Department of Agriculture, who during the sum-

mer months will travel over the province, meeting municipal weed inspectors and councillors regarding the best methods for enforcement by municipalities of the provisions of The Noxious Weeds' Act. The men who have been engaged for this work are, Neil Gilmour, Moose Jaw; Wm. Thompson, Veregin; J. S. Naylor, Hawarden; and L. E. Kirk, T. M. Tullis and W. E. Walker, of Saskatoon.

While it is generally admitted that so long as the present methods of farming are continued, noxious weeds will be a serious problem, it is expected that the influence of these special representatives will bring about a substantial improvement in agricultural methods and tendencies. More meat-producing animals must be raised on grain farms if noxious weeds are to be controlled. This will mean fenced farms, smaller farms, a greater variety of crops and surer returns.

DAIRY INSTRUCTION CAR

THE Dairy Branch of the Department of Agriculture, Regina, in conjunction with the College of Agriculture, Saskatoon, and the Canadian Northern Railway Company, has recently completed a series of meetings in the interests of dairying through the medium of a special dairy car.

Instruction cars properly equipped for the purpose of disseminating agricultural information have, in recent years, become decidedly popular among those who attend agricultural meetings. An ordinary pas-

senger coach provides a comfortable place for an audience to assemble and is easily fitted with a modern lantern and canvass for illustrated pictures, a feature which is always popular and by which ideas can be impressed more firmly on the mind than by perhaps any other methods. The lecturers carried more than one hundred slides showing photographs of some of the world's best dairy animals, sanitary stables, dairy utensils and other information of interest.

Sixty-three meetings were held on the main line of the C.N.R., be-

tween Lloydminster on the West and Togo on the East. Four meetings were held on the Sturgeon River Branch which runs from North Battleford to Turtleford. Three meetings on this line were cancelled on account of the severe weather. On the Saskatoon-Calgary line of the C.N.R., twenty-four meetings were held extending from Delisle to Alsask.

Altogether ninety-one meetings were held, the total attendance being 3,536. This shows an average attendance of 38.8.

That there is a growing interest being taken in dairying throughout Saskatchewan is evident to anyone who has given the question serious consideration. The output of

3,800,000 lb. of creamery butter during 1915 shows a most substantial growth. It was thought that the enormous grain crops harvested the past season would tend to lessen the interest taken in dairy matters, but the reverse seems to have occurred. Mr. W. A. Wilson, Dairy Commissioner, reports that the output of butter at the fifteen co-operative creameries operated by the Dairy Branch shows a decided gain during the past few months over the output for the same period in any other year. The make for November shows a gain of over 34 per cent over the same period of 1914; December a gain of 77 per cent; January, 84 per cent, and February, 111 per cent.

ALBERTA

SHORT COURSE SCHOOLS

BY H. A. CRAIG, B.S.A., DEPUTY MINISTER OF AGRICULTURE

THE Department of Agriculture for Alberta put on a series of short course schools during January and February as usual. The work was expanded as far as the number of points served was concerned, there having been thirteen schools held as against six last year. On the other hand the work at each place was condensed into three full day and two night sessions at each place. The majority of places visited were the smaller centres away from the provincial agricultural schools, demonstration farms and other educational services in agriculture, except in the cases of the four chief cities of the province, Lethbridge, Medicine Hat, Calgary and Edmonton.

The subjects dealt with embraced both the farm and home interests, including live stock, dairying, soil and crop management, poultry work, cooking, sewing, home nursing, laundry work and household sanitation. Five cars of live stock were carried for

demonstration purposes. These were made up of heavy horses, beef, dairy and dual purpose cattle and representatives of three breeds of medium-wooled sheep. The evening lectures were devoted to such special subjects as dairying and poultry raising, but included likewise a number of general subjects, such as agricultural education, school consolidation, marketing, etc. Speakers for the evening sessions included the Hon. Duncan Marshall, Minister of Agriculture, Dean Howes, College of Agriculture, H. A. Craig, Deputy Minister of Agriculture, and local members in the various constituencies, as well as the regular school staff.

The sum of the averages of attendance at the six day and two night sessions over all the courses amounts to a total of 4,000 people, made up of 2,600 men and 1,400 women. The weather during about two-thirds of the itinerary was very cold, which interfered rather seriously with the attendance at a number of the meet-

ings; however, the interest was active and satisfactory in all cases. Many of the citizens of the larger places are at present interested in farm and stock enterprises and there is likewise an active sociological interest in the whole question of rural improvement on the part of the people of the towns and cities.

The instruction staff was as fol-

lows:—Alex. Galbraith, J. Clements, W. F. Stevens, A. E. Meyers, J. McCaig, A. W. McIntyre, S. G. Carlyle, A. E. Howes, W. H. Fairfield, F. S. Grisdale, C. S. Noble, G. Hutton, A. W. Foley, C. A. Marker, T. A. Benson, Miss M. McIsaac, Supt. of Women's Institutes, Miss A. Carlyle, Miss M. M. Trood and Miss M. Morkin.

BRITISH COLUMBIA

A PUBLICATIONS BRANCH FORMED

BY W. E. SCOTT, DEPUTY MINISTER OF AGRICULTURE

A recent new departure of the Department of Agriculture has been the formation of a Publications Branch. A monthly agricultural journal is prepared and issued by this Branch, and circulated amongst the farming community of the province.

The object of this magazine is to provide a medium whereby the Department of Agriculture and farmers in different districts of the province may be brought into closer touch, and work in more effective co-operation.

It is the intention of the Department to make this magazine a medium whereby concise, practical, and timely information and advice may be conveyed to farmers.

Matters of interest to farmers' and women's institutes are featured in this journal. Articles on live stock, dairying, poultry, soils and crops' work, farm demonstrations, field crop competitions, boys' and girls' competitions, cow-testing association work, selected and pedigreed seed distribution, and similar topics, are prepared by the expert officials attached to the Live Stock Branch of this Department, and published in the magazine.

The Horticultural Branch deals with all matters of interest to orchardists, vegetable growers, and gardeners. Articles dealing with hints on selection of site, preparation

of ground, selection of varieties, planting, pruning, spraying, cultivating, and general treatment of orchards, will be published from time to time.

Space is devoted in the magazine to questions from farmers that will be answered in the following issue. A "What to Do this Month" page is also included, and in its columns information will be given monthly as to lines of work which should receive attention during that month. It is the intention of this Department to gradually extend and improve on this magazine, and to make it a publication the value of which will be readily realized by farmers.

A nominal subscription fee of twenty-five cents will be charged for the year, to cover cost of postage. The Publications Branch will also undertake the preparation of suitable articles for publication in newspapers circulating in agricultural districts of the province. These will be sent out regularly each week to all these newspapers, which have been asked to reserve space for this purpose.

The mailing of bulletins, circulars, reports, etc., to those requesting them, will be supervised by the Publications Branch. The establishment of this Branch of the Department is in line with the recommendation of the Royal Commission on Agriculture.

INSPECTION OF FRUIT PESTS

BY W. E. SCOTT, DEPUTY MINISTER OF AGRICULTURE

The work of the inspection of imported fruit, nursery stock, vegetables, trees, plants, rice, grain, corn, etc., and field and orchard inspection work has heretofore been administered by the Fruit Inspection Branch of this Department under the direction of the late Thomas Cunningham, Inspector of Fruit Pests. A reorganization of this work has been effected, and all field inspection work will hereafter be under the direction and control of the Horticultural Branch of the Department.

R. M. Winslow, B.S.A. Provincial Horticulturist, has been gazetted as Provincial Horticulturist and Inspector of Fruit Pests. W. H. Lyne

has been gazetted Inspector of Imported Fruit and Nursery Stock.

The duties of the Inspector of Imported Fruit and Nursery Stock will be confined to the work now carried on at our Provincial Inspection and Fumigation Station at Vancouver, by enforcing the provisions of our Provincial Regulations, and also those issued under the Dominion Destructive Insect and Pest Act.

The inspection of imported fruit, vegetables, nursery stock, grains, rice, corn, etc., at all ports of entry into this province, will also be undertaken by this branch of the Department.

WOMEN'S INSTITUTE CONFERENCES

THE following resolutions were passed at the closing meetings of the Women's Institute conferences held in 1915 at Nelson, Salmon Arm, Chilliwack, and Victoria, and were endorsed by the Department of Agriculture:

1. Resolved, that this conference endorse the aims of the British Columbia Consumers' League, and urge the members of the institutes to pledge their support.

2. Whereas, the merchants claim that the demands of their customers make the purchasing of foreign goods and produce a necessity, therefore be it resolved, that in future the members of institutes be urged to refuse to purchase such articles as are not Canadian or British production, if such can be obtained.

3. Whereas, our local markets are flooded with American fruit while British Columbia fruit of fine quality may be secured, the fault in this case being laid at the door of the wholesaler; Resolved, that the Women's Institutes earnestly request that the matter be thoroughly investigated and consistently dealt with.

4. Resolved, that the institutes be asked to appeal to their local representatives of the provincial legislature for a revision of the laws of British Columbia relating to women and children with a view to their betterment.

5. Resolved, that the institutes be urged to take keen interest in school affairs, and work to have one of their number on the school board whenever feasible.

6. Resolved, that each institute be urged to procure travelling libraries, try to have school libraries placed in their schools and endeavour to reach outlying districts and isolated families with reading matter.

7. Resolved, that in the opinion of this conference there should be action taken in every district, by the Women's Institutes, to see that there is proper supervision of children during the noon hour at school.

COMPETITIONS ARRANGED

Competitions for the year 1916 have again been arranged, as follows:—

(a) Prizes for institutes having the best average attendance at meetings during the year, based on membership as returned to the Department on the list dated June 30th, 1916: The prizes to consist of books to form the nucleus of a library to the value of—1st prize: \$20; 2nd prize: \$10.

(b) Prizes for institutes having the best programme for the year 1916, consisting of books to the value of—1st prize: \$15; 2nd prize: \$10.

(c) Prizes for essays by institute mem-

bers on the following specified subjects.—1st prize: \$10; 2nd prize: \$7.50; 3rd prize: \$5; Economics in the home; how can women assist in food production in 1916; reading matter for the home; the advantages of boys' and girls' clubs; the importance of vocational and technical training; the inter-dependence of town and country.

(d) Competitions for junior members.

Prizes for the best papers by junior members on the following subjects—1st prize: \$5; 2nd prize: \$2.50; Notable Canadian women; a brief history of the present war.

Essays should be from 1500 to 2000 words in length. Programmes will be judged from the point of view in merit as regards arrangement and subjects for discussion during the year, due allowance being given for style and printing.

FOUL BROOD INSPECTION

OWING to the continuance of Foul Brood in certain districts of this province, which has been directly traceable to bees imported from outside points into the province, the Hon. the Minister of Finance and Agriculture issued a public notice under authority of Order-in-Council No. 468, approved April 27th, 1915, to the following effect:—

"Notice is hereby given in conformity

with Section 12 of the Foul Brood Bees' Act, 1911, Chap. 18, that any or all bees imported with their hives into the province of British Columbia shall be quarantined at the point of entry into said province or at such other place as may hereafter be appointed for a period of not more than nine months, and if such bees are found to be infected they shall be destroyed; and to further recommend that bees imported by the pound, in packages, or crates, may be admitted into the province of British Columbia upon production of a satisfactory certificate, from a State or Provincial Inspector, of freedom from Foul Brood at point of origin."

THE PROFIT-MAKING HEN

The World's Best Layer—What is the world's egg-laying record? So far as we have authentic records of yield the honour must go to Lady Englantine, a White Leghorn hen owned by the Delaware Agricultural College. She laid 314 eggs in 365 days.

In the British Columbia egg-laying contest, the average number of eggs laid in the year by 240 birds was 165. In the winning pen the average per bird was 223. When we consider that the yield per hen on Canadian farms was only 46 (1911 census) a wide field for practical poultry improvement opens up. It is obvious that like the average cow the average hen is a poor and unprofitable producer. The principles that are being applied in milk production must also be applied to egg production. The hen that does not come up to the standard of profitable performance must be rigidly discarded. Write to the Dominion or Provincial Poultryman for information as to "bred-to-lay" poultry. Your time, chicken food, and eggs are all worth money. *The Agricultural War Book, 1916.*

PART III

Rural Science

SCHOOL FAIRS FOR 1916

NOVA SCOTIA

BY L. A. DEWOLFE, B.A., DIRECTOR OF RURAL SCIENCE SCHOOLS

WE are sure the number of fairs to be held in 1916 will be double that of 1915.

Schools have unlimited freedom in the conduct of their fairs. The government helps to buy seeds where the section will not get their own supplies. About 75 per cent of the schools supply their own seeds through the efforts of the teacher.

Last year we gave eggs to school children. This year they must pay forty cents a setting. The government will pay the balance. This offer is limited to the first three hundred children who apply.

Plants that must be started under glass may be purchased by the children, or they may plant seeds in their own hot-beds. In no case shall we give such plants; for that will deprive our children of the opportunity of learning the possibilities of a hot-bed. The time will possibly come when we will offer prizes for hot-bed products; but thus far we have not done so.

About two thousand children will exhibit vegetables.

“ one thousand children will exhibit flowers.

“ one thousand girls will exhibit sewing and fancy work.

“ one thousand girls will exhibit cooking and canning.

“ three hundred children will exhibit poultry.

“ one thousand children will exhibit Nature collections (plants, etc.)

Besides the local and county exhibitions this year, about forty schools will exhibit garden and household produce at the Provincial Exhibition, Halifax. This will be the first time children have exhibited vegetables and cut flowers here; and it will also be the first attempt at a domestic science exhibit from rural schools.

The government will spend only about \$300 for eggs and seeds; \$300 for prizes, and \$100 for exhibition expenses. All other supplies, expenses and prizes will be supplied locally.

QUEBEC

BY J. C. MAGNAN, B.S.A., OFFICIAL AGRICULTURIST

THE main objects of the school garden movement in the province of Quebec are the following: (1) To create a liking for agriculture among school children;

(2) to teach the school children the general principles that should be known by every farmer; (3) to “ruralize” elementary school teaching, that is, to keep the children

continually in an agricultural atmosphere; (4) to form progressive farmers and citizens, who will honour the agricultural profession; (5) to get the school trustees and the taxpayers interested in the work of the school; (6) to make public opinion favourable to the farming profession. This is the programme that we are striving to realize. The work already done in this line and the very good results obtained give us the best hopes for the future.

WHAT IS BEING DONE

Preliminary Work.—Special reports regarding school gardens are made every year by school inspectors, who visit each school twice during the year. School gardens are maintained, or new ones are established, as recommended in these reports. These inspectors meet once a year at the Oka Agricultural Institute to receive instructions on their work. They also attend practical courses in agriculture, lasting three weeks; they have, therefore, a good opportunity to learn about farming and horticulture.

Pamphlets, special circulars, seed grain and chemical fertilizers are distributed to the schools. In June, a special list of questions is sent to the teacher of every school where there is a garden and where agriculture is taught. This report must be signed by the teacher and handed to the treasurer of the municipality, who countersigns it and sends it to the Department. This report enables us to keep tab on the work of the schools.

Arbour Day.—When Arbour Day comes, a circular is sent to the schools. It contains a number of practical facts on tree planting, suitable varieties, pruning trees, advantages of trees, the conservation of our forests, etc. This circular must be approved by the Superintendent of Education.

Agricultural School Museums.—In co-operation with the Department of Education, it is intended to give special encouragement this year to

the organization of agricultural school museums, facilitating the teaching of agriculture in the schools. These school museums include the following samples and articles: collections of grain and grasses, collections of useful plants, weeds, various types of soils, charts representing varieties of vegetables, fruits, trees, breeds of live stock, etc.; catalogues and buildings showing the chief agricultural implements, farm buildings, etc.

This material, which is not very expensive, is placed in a cupboard, fitted with shelves, in one of the school rooms; this is the school museum.

School Gardeners' Clubs.—The establishment of children gardeners' clubs is encouraged, in order to prepare the farmers of to-morrow for the useful part which they will be called upon to play in their village and the development of co-operation and community spirit. The programme adopted for these clubs varies according to the school, the age of the pupils and the district where they live. A special circular on these clubs has been prepared for the teaching staff; this circular is distributed in every school.

Agricultural Teaching Propaganda.—A special propaganda consisting in a series of articles written for the newspapers of the province, and dealing with the school garden and teaching of elementary agriculture, has been added to our annual programme.

"L'enseignement Primaire" which is the official pedagogic organ, publishes every month an article on the teaching of agriculture in the school, in order to facilitate the task of the teaching staff and to let the public know of the school garden movement.

Agricultural School Fairs.—Twenty-nine agricultural school fairs were held in 1915 with the very best results. It is not intended to hold district fairs requiring a great deal of

work this year; only village and local fairs, that is to say one-school fairs will be encouraged. However, the holding of such fairs will be encouraged only in those communities where the school boards are willing to co-operate with the Department and pay a part of the expenses.

Local Agricultural Contests. --Local agricultural contests among boys and girls from ten to eighteen years of age will be encouraged this year in order to create a liking for agriculture among the children. These contests will be in charge of the teachers, the school boards and the women's institutes. Seed will be selected for these contests and prizes will be given where it is desirable to do so.

Lectures in Normal Schools.—Agricultural lectures in the normal schools for boys and girls will be encouraged as they have been in the past. It is proposed, this year, to give more time to the teaching of agriculture in the school and to the arrangement of the school garden. It is important that normal school pupils be well-informed in these matters, which will result in so much good for country children. To sum up, the school gardens will be maintained and improved and the teaching of elementary agriculture in the school will also be improved.

Such is the programme by means of which we hope to make our children better farmers and better citizens.

COUNTY OF PONTIAC

BY J. K. KING, B.S.A., MACDONALD COLLEGE DEMONSTRATOR

PREPARATIONS are being made by the demonstration branch for the holding of two school fairs in the county in 1916. The smaller of the two fairs will take in fifteen schools or about two hundred children between the ages of ten and fifteen years. The larger fair will include twenty-five schools with some four hundred and fifty children participating. This makes a total for the two school fairs of six hundred and fifty children eligible for school-fair work.

MATERIAL FOR DISTRIBUTION

One hundred and fifty settings of bred-to-lay Barred Plymouth Rock eggs will be divided equally among these schools. Two hundred and fifty ten pound lots of Green Mountain potatoes, some sixty (two ounce) samples of Early Malcolm corn, a slightly larger amount of Quebec No. 28 corn, Marquis wheat, Banner oats, one hundred and fifty packages of flower seed as well as some small quantities of Swede seed, tomato seed and a few collections of vegetable and flower seeds to schools con-

ducting school gardens. All of the foregoing material is supplied by Macdonald College.

DIRECTION OF THE WORK

It is one of the objects of the demonstration branch to co-operate as much as possible with the teachers, in order to make a wise distribution of the material sent out. Especially is this necessary in the case of the settings of eggs, so that pupils who have never had a setting previously may be given the preference, providing they show indications of taking proper care in the hatching and raising of the chickens.

With each lot of material sent out full directions as to the growing and raising of the product are attached, and the demonstration branch is always ready to give further information that may be requested.

During the summer a member of the demonstration branch visits each pupil that has taken material and scores the plot for which prizes are given for the best kept plots in the different classes. Visiting the pupils encourages them to greater effort

and result in a greater number showing material at the fair held in the fall.

PRIZE MONEY

For the larger school fair the school boards provide the prize money, in the other, the agricultural society

furnish the total amount of prizes.

Special prizes are given for foals, calves, sheaves of grain (hand selected from the general crop on the home farm), collections of weeds, and weed seeds. To interest the girls in particular special prizes are given for cooking and sewing.

MANITOBA

BY S. T. NEWTON, B.S.A., DIRECTOR, EXTENSION SERVICE, MANITOBA AGRICULTURAL COLLEGE

POSSIBLY no work undertaken by the Extension Service has met with a more hearty response than the work of the Boys' and Girls' clubs. The membership in 1913 was 750; in 1914, 1850; last year, 5500, and this year the applications already received gives promise of an enrolment of close on 10,000.

As in previous years, certain material will be supplied free for some of the contests, in others the pupils will supply their own material.

In fodder corn growing and in peas and beans for canning, a quarter pound package of each is supplied free in order to encourage the home canning of vegetables. In the purchase of eggs for hatching, a standard price of \$6 per hundred was set. Last year 10 pounds of potatoes were supplied, but this year it is hoped to get better results from an educational standpoint by having the contestants select their own potatoes. In pig raising the banks are co-operating to the extent of loaning money to the boys on their own notes for the purpose of buying a pair of pigs as well as feed for six months.

PRACTICAL MECHANICS AND WOODWORKING

One phase of Boys' and Girls' club work, which at first thought would not seem to be strictly agriculture, is exercises in mechanical drawing and practical mechanics, but in very few vocations is a know-

ledge of tools and tool processes in greater need than in agriculture, where the matter of general repair and upkeep is an important part of the business of farming, while all farm catalogues and journals are replete with line drawings and illustrations.

During the summer vacation twenty-five two weeks' short courses in practical woodworking, and the same number in sewing, will be held in connection with the first thirty clubs organized for this season's work. These courses will be held at rural schools, and only such materials and equipment will be used as can actually be found on the farms, and are necessary for work that has to be done.

Each Saturday afternoon will be devoted to community interests, when, in addition to holding an inspection of the work done, special lectures on community subjects will be given between two and four, after which time organized sports and a basket picnic will fill up the balance of the day. On the Sunday following, special church services are being arranged, when the college speakers will take part in the day's programme.

STUDY CLUBS

Another feature of Boys' and Girls' club work is the organization of study clubs. Already work along

this line has been undertaken with very gratifying results.

The coming year will see hundreds of Manitoba boys dropping out of school to take the places of hired help, brothers and fathers who are enrolled in the armies of the Empire. These boys, while too young to serve the community on the battlefield, are nevertheless doing their bit in a very necessary line of effort, and in organizing study clubs among the boys from 15 to 18 years of age it is hoped to supply in a measure the loss occasioned by their early withdrawal from the schools.

The membership in each club is limited to five or six. A small study library is loaned to each club for a limited length of time, and a series of study questions submitted by the various departments of the college. For instance, during November one club will be studying poultry. Once each week the members of the club meet at each other's home for the purpose of discussing the questions submitted by the college. Answers representing the combined opinion of the members are forwarded to the Extension Service for correction or approval. At the end of each month an examination paper is sent to the teacher of the nearest school, and each member writes his answers independent of the others, and all are forwarded by the teacher to the college.

EXTENSION AND ADVANTAGES

Other clubs will be studying pigs,

still others, mechanical drawing or potato growing, so that the work does not all fall to one department at the college. Similar courses are being provided for the girls, for they, too, though to a less extent, have been affected by the war.

The advantages of study clubs over correspondence work are:—

1. The chairman of each club gets continued practice in presiding over the deliberations of the club.
2. The secretary in keeping a record of these deliberations and conducting the correspondence of the club is getting a business training which will serve him later in the wider activities of the community.
3. The social side of life will be promoted by the weekly discussions.
4. The discussions will lead to a closer study of the subject than would be the case were each one working by himself.
5. The material used and experience gained in connection with Boys' and Girls' club work can be used to advantage by the study clubs.

PRIZES ACCORDING TO ENTRIES

For the Fall Fairs most of the prize lists are being arranged on a sliding basis, the larger the number of entries in any class, the larger the prizes and the more there are in each. For instance, if there are three entries, there will be two prizes, while if there are thirty entries, there will probably be twenty prizes. The School Fair has come to be the really big day in each community, and the boys and girls are being encouraged by every interest in the district.

SASKATCHEWAN

BY A. W. COCKS, B.Sc., DIRECTOR OF SCHOOL AGRICULTURE

UP to this year the school fair movement in Saskatchewan has been promoted by various organizations, among which the most influential have been the teachers' associations of the province. A few weeks ago the Department of Education distributed to every school

district in the province, School Agriculture Circular No. 3: Rural Education Associations. The object of the Rural Education Association is to arouse public interest in education and its relation to rural life generally and in agricultural education particularly. Many lines

of work will be undertaken by these associations, but one of the most important will be the organization of school fairs. It has been proposed that a committee be appointed by each Rural Education Association to take charge of school fair work.

To further this movement the Department has made arrangements with the co-operative Branch of the Department of Agriculture by which schools will be able to obtain seeds of vegetables, flowers, grasses, cereals and trees at prices considerably lower than those usually charged. Information respecting this supply of seeds is given in School Agriculture Circular No. 4: Seed Catalogue for School Gardens. The seeds are not supplied free, but will be sold in packets at four cents per

packet (post paid). The Co-operative Branch of the Department of Agriculture has obtained a supply of something over 25,000 packets of seed.

In municipalities where an agricultural secretary is employed it is probable that many of the schools will undertake work in connection with the raising of pedigree seed, pure breeds of poultry, etc. In such cases the necessary seed and eggs will be supplied by the Agricultural College, Saskatoon.

Further information and assistance is provided by the Department of Education in School Agriculture Circular No. 5: School Fairs, which outlines the objects of the fair and gives suggestions for rules, prize-lists and prizes.

SASKATCHEWAN

A SCHOOL GARDEN ORGANIZATION

BY FRED W. BATES, B.A., M.Sc., DIRECTOR OF SCHOOL AGRICULTURE

THE success of school gardening in any district depends to a great degree on several factors of extremely variable character—the attitude of the teacher, of the trustees, of the parents; the weather and the various animal and insect pests. There is another factor, however, that all too frequently is ignored, but upon which, almost more than on anything else, permanent success is dependant. That factor is the organization of the district for the school garden work.

The necessity of some form of organization is not hard to demonstrate, but the determining value of such in the permanent success of the enterprise is frequently overlooked. A careful study of the school garden movement soon reveals the importance of this feature of the work. Many instances are on record where a wide-awake teacher began and developed an excellent school garden

but whose efforts failed to produce lasting results simply because no



FRED W. BATES, B.A., M.Sc.
Director of School Agriculture, Saskatchewan

plan had been worked out to hold the interest, and command the co-operation of the people. All too frequently the departure of such a teacher from a school marked the decline of the gardening operations. It is useless to say that this should not be; something constructive must be done; otherwise, until we can develop and train all our teachers to thoroughly appreciate the value of this work, we will be faced with the annual rather than the permanent school garden.

On the other hand we find instances where the success of the garden seems little influenced by change of teachers, the interest of the community in the enterprise impelling

of the municipality, called the teachers together and a discussion of school garden work was carried on which resulted in the formation of a teachers' association for the municipality with Mr. Pratt as Honorary President. As there had been no gardening at the various schools, there was no ground prepared for planting, making it necessary to adopt the home garden method. The association organized as an incentive to the garden operations, a series of school fairs; first, one for each school toward which the school district contributed \$10 for prizes, etc., and later, a fair for the municipality where the winners at the local fairs entered into competition for the



THE LOST RIVER SCHOOL GARDEN

Wheat shown in background gave a yield of 56½ bushels per acre.

the new teacher to carry to completion the work already begun. Almost invariably it will be found that in such cases the whole community has been organized about the school as a centre for the garden operations. It is the purpose of this article to sketch the development of the Lost River Municipal School Garden Association, which for the past two years has carried to successful issue a scheme embracing the schools of this municipality.

ORGANIZATION AND DEVELOPMENT

Early in the spring of 1914, Mr. J. M. Pratt, the agricultural secretary

various shields and prizes, and for which the municipality contributed \$10. Eight schools entered the association and competed for the prizes.

In 1915 the association decided that the results of the previous year's experience amply justified a continuation of the project, and early in the season they laid their plans for the summer's work. Again eight schools entered but only five of these competed at the final exhibition, as a succession of fortuitous circumstances prevented the successful completion of their plans. The experience of the preceding year showed the great advantages to be derived

by having the garden on the school grounds. As this was in several cases impossible, arrangements were made with owners of tilled land adjacent to the various schools and an acre of well cultivated land was in this way acquired close to each school for the use of the pupils.

In several schools there was only a small enrolment and an acre was more than necessary for the usual garden plots. The association decided to broaden its work and application was made to the Canadian Seed Growers' Association for pedigreed oats and wheat as a result of

an ideal one for gardening these efforts met with abundant success. The plots were judged as standing crops and credits given. The wheat at the Lost River school yielded at the rate of 56 bushels to the acre, while the oats from Simmon's school ran slightly over 123 bushels to the acre. Notwithstanding the adverse weather conditions these gardens produced some of the best vegetables seen last season. The gardens were all kept in excellent condition but in some of the schools there was a little too much ground for the number of pupils, and the labour expended by



THE LOST RIVER MUNICIPALITY SCHOOL FAIR

which they obtained twenty pounds each of Marquis wheat and Banner oats, for each school. This was sown at such a rate that there was slightly over a quarter acre of wheat at each school while the area in oats averaged less than a quarter acre. This left about a half acre for the garden, in each case, and this area was divided into individual plots with quite extensive community plots in some instances.

SUCCESS IN 1915.

Although the year 1915 was not

the children left room for criticism

Each school held its fair in the home school on Friday, October 1st, and the winners selected represented their respective schools at the municipal fair held the following day, Saturday, October 2nd. In addition to the exhibit shown by the individuals, each school competed with a collection representing the whole range of the work attempted for the shield that stood for the best school garden of the organization. It was my privilege to be present at the final exhibition and there was no

doubt possible regarding the interest aroused by the enterprise. The whole countryside was at the fair, which was conducted in a large barn centrally located. The ladies provided the eatables and a most appetizing dinner was served; speeches were delivered by representatives of the provincial Departments of Agri-

posed of to the farmers of the locality.

The experience in Lost River municipality is not a strange one, but is simply an instance of the general rule. School gardening succeeds where there is sufficient interest aroused, while sooner or later it fails if it is not organized as a community project. Of the uses made of the in-



THE SIMMON'S SCHOOL GARDEN
Oats in this garden yielded over 128 bushels per acre.

culture and of Education, who also acted as judges of the exhibits; competitions in judging grains and naming mounted specimens of plants and weeds were entered by many pupils, and, last, but not least, as far as interest was concerned, an auction was held in which the garden produce and the seed wheat and oats were dis-

formation gathered and the knowledge acquired it is not the purpose to write. Suffice it to say that the vegetables grown by each child were weighed at the school and then sold in bulk, the division of the proceeds being worked out by the pupils themselves, which provided exercises in arithmetic for several days.

RURAL EDUCATION ASSOCIATIONS

MR. A. Kennedy, M.A., Inspector of Schools in the Weyburn Inspectorate, Saskatchewan, announces the organization of the following Rural Education Associations in his district:

The R. E. A. of Weyburn, R. M. 67, at Weyburn. Pres.: Chas. J. MacKay; Sec.: E. W. Jervis.

The R. E. A. of Griffin, R. M. 66, at Griffin. Pres.: Bert See; Sec.: Miss Jessie Kee.

The R. E. A. of Fillmore, R. M. 96, at Fillmore. Pres.: S. R. Carrothers; Sec.: A. R. Langille.

The R. E. A. of Tecumseh, R. M. 65, at Stoughton. Pres.: Cameron Campbell; Sec.: S. G. Goodman.

In addition meetings have been

arranged for the purpose of organizing the Rural Education Associations of Cymric, R. M. 36 at Midale; Lomon R. M. 37 at Colgate; Brock R. M. 64 at Kisbey and Wellington R. M. 97 at Cedoux. It is the hope of Inspector Kennedy to organize a Community Centre Club in each school district in the Weyburn Inspectorate.

THE PROGRAMME FOR 1916

School exhibitions have been arranged to be held in each municipal centre during September. A day for games, athletics and physical training is planned for October.

A concert is planned for December.

A seed and stock show was arranged for February.

An oratorio was planned for Easter.

A festival of literature and music is planned, and syllabus prepared, for June.

In addition to the foregoing the following competitions, made possible through the generosity and public spirit of a number of the leading firms and business and professional men of Weyburn, have been announced in Weyburn R. M. 67:

CONTEST IN HOUSEHOLD SCIENCE

The Soo Line Mills, Limited, Weyburn, has provided \$50 for prizes for the successful competitors in a household science contest. The purposes of this contest are:

1. To stimulate an interest in household science;
2. To encourage a study of the problems of the farm home;
3. To awaken an interest in, and a recognition of, the importance of wholesome food, suitable home furnishings and economic thrift;
4. To instil a love of beautiful homes and to create a greater interest in farm life.

Each competitor must bake two loaves of bread; one dozen buns; one dozen tea biscuits; one dozen cookies; one pie, and one layer cake,

all of which must be exhibited at the fair to be held under the auspices of the Weyburn Agricultural Society in Weyburn on or about August 1st, 1916.

CONTEST IN MANUAL TRAINING

Mr. Joseph Mergens, vice-president and general manager of the Canadian Investment Co., Limited, Weyburn, has provided \$50 for prizes for the successful competitors in a manual training contest:

The purposes of this contest are defined as:

1. To stimulate an interest in manual training;
2. To encourage a study of the problems of suitable and sanitary farm stock buildings;
3. To awaken an interest in, and a recognition of, the importance of desirable types of farm buildings;
4. To instil a love of beautiful surroundings and to create a greater interest in farm life.

Each competitor must plan, with specifications, and construct a farm stock building, capable of housing a litter of pigs, or a flock of five sheep.

THE CLEANEST BILL OF HEALTH

Dr. G. J. Whetham, Weyburn, has provided \$50 for prizes for the successful competitors in a contest among school class-rooms *re* the cleanest bill of health.

The purposes of the contest are:

1. To stimulate an interest in the health of children;
2. To encourage a study of the problems arising out of the health of children, particularly in relation to infection and contagion;
3. To awaken in the children particularly an interest in the general health of the community with a view to preventing the spread of sickness and disease;
4. To create greater interest in farm life.

Each case of illness causing absence from school shall be recorded in the school or class-room register, and shall be certified to by the teach-

er as is customary by regulation in the case of attendance. Absence for other causes or reasons, removal from school district, or entrance into the school district shall be recorded in the register. As soon after December 31st as possible the registers shall be examined by a committee of competent judges and awards made on a percentage basis.

THE PRACTICAL OPERATION OF FIRST AID

Dr. M. A. Nickle, Weyburn, has provided \$50 for prizes for the successful competitors in a contest in the practical operation of first aid during 1916.

The purposes of the contest are:

1. To stimulate an interest in first aid to the sick or injured;
2. To encourage a study of the problems arising out of sudden illness or accident with a view to relieving suffering and saving life;
3. To awaken a recognition of the importance of training teachers and children in the most effective means of rendering first aid.

In case of sudden illness or accident, a full report shall be made of the case, giving details, including names, nature of illness, manner of treatment, promptness and success of the operation. This report shall be signed by at least two witnesses, or others duly qualified to report the facts of the case and forwarded to Inspector Kennedy.

THE RAISING AND FEEDING OF SHEEP

The Canadian Bank of Commerce will lend up to fifty dollars (\$50) to each member of the club, upon his or her own note without security, with interest at the usual rates, for the purchase of a flock of five sheep, such sheep to be raised and cared for by the member in accordance with the rules of the contest.

Messrs. Edmondson and Betts have donated \$100 for prizes for the successful competitors in the contest.

In order that the most successful competitors may have some permanent record of their success The Canadian Bank of Commerce will give a silver medal to the competitor winning the highest number of points and a bronze medal to the competitor winning the second highest number. Both medals will be suitably engraved by the bank with the name of the competitor, etc.

The purposes of the contest are:—

1. To stimulate interest in the production of sheep;
2. To encourage a study of the problems of raising and feeding sheep with a view to securing the best results and the largest profits;
3. To awaken a recognition of the importance of desirable types of live stock;
4. To instil a love of animals with a view to creating greater interest in farm life.

RULES AND REGULATIONS

Each competitor must feed and care for a flock of five sheep from the time of purchase to the date of final judging.

The first judging which will be made sometime in May, 1916, will be based on the general appearance of the flock and the provision made for housing and feeding. A maximum score of 50 points will be assigned for this judging.

The second judging will be made on or about August 1st, 1916, and will be based on the awards made by the official judges at the fair, held under the auspices of the Weyburn Agricultural Society, in Weyburn, on or about August 1st, 1916. A maximum score of 75 points will be assigned for this judging.

The third and final judging will be made on or about October 1st, 1916, and will be based on the market value of the flock. A maximum score of 100 points will be assigned for this judging.

Each competitor must keep a complete record of the flock including dates, weights, feeds, rations, expenses in connection with housing, pasture, feeding, receipts, etc. This record must be submitted at the time of the final judging and a maximum score of 75 points will be assigned for this judging.

THE RAISING AND FEEDING OF POULTRY

The Weyburn Security Bank, Weyburn, has provided \$50 for prizes for the successful competitors in a contest in the raising and feeding of poultry.

The purposes of the contest are:—

1. To stimulate an interest in poultry;
2. To encourage a study of the problems of raising and feeding poultry with a view to securing the best results and the largest profits;
3. To awaken a recognition of the importance of desirable types of poultry stock;
4. To instil a love of animals and birds with a view to creating greater interest in farm life.

RULES AND REGULATIONS

Each competitor must purchase or otherwise secure a setting of eggs; must feed and care for the chickens from such setting; must exhibit the brood of chickens at the fair to be held under the auspices of the Weyburn Agricultural Society in Weyburn on or about August 1st, 1916; the judging will be based on the results of the awards made by the official judges at the fair; a maximum score of 100 points will be

assigned for this judging; must have the brood of chickens ready for the final judging on or about October 1st, 1916; this judging will be based on the market value of the brood; a maximum score of 125 points will be assigned for this judging; must keep a complete record of the brood, including dates, weights, feeds, rations, expenses connected with housing, feeding, sale, etc., and receipts; a maximum score of 75 points will be assigned to the records submitted at the time of the final judging.

In all of these competitions boys and girls up to eighteen years of age (before December 31, 1916,) living in Weyburn R. M. 67, or in any school district, a portion of which lies within Weyburn R. M. 67, or living in the following school districts:—Waverly, S.D. 1318, Prairie View, S.D. 960, Lily Glen, S.D. 1504 and Prairie Centre, S.D. 1271, shall be eligible to take part.

In addition to the foregoing, competitions are being conducted in the raising and feeding of dairy cattle, beef cattle and swine. The details with regard to the competition in the raising and feeding of swine were published on page 268 of the March issue of THE AGRICULTURAL GAZETTE.

School-gardening is vastly different from any other kind of gardening. Ordinarily, the value of gardens is computed in terms of the money value of the crops produced, but the value of the school-garden should be estimated in terms of its influence upon the gardeners. Unless they have gained valuable knowledge through experience in their gardens, and unless they have had new and wholesome life-guiding interests aroused and have become more appreciative of the value and beauties of life and their own growing ability to add to or take from it, they have not experienced the real value of the school-garden.—*Public Schools Report, British Columbia, 1914-15.*

Special Contributions, Reports of Agricultural Organizations, Notes and Publications

WHILE the libraries of the Canadian agricultural colleges and the larger agricultural schools have made suitable provision for securing, cataloguing and using the bulletins of the Departments of Agriculture, no such arrangement has been made by any considerable number of smaller schools where agriculture is taught. These schools do not have libraries to take care of their publications, nor do many of them have suitable filing cases or even sufficient shelf room. As a result the agricultural bulletins and pamphlets which have been procured by these schools are frequently piled up in some corner, unused and unusable, the great majority of teachers in the public schools failing to appreciate the range of useful information embodied in these publications. In the hope of helping such teachers, this description of a simple method of cataloguing small collections of agricultural publications has been reprinted in a revised form, to suit conditions in this country, from the December issue of the *Agricultural Education Monthly* of the States Relations Service, U. S. Department of Agriculture.

MATERIAL FOR THE CATALOGUE

atalogue: (1) A few cards for the catalogue; (2) a box to hold the cards, and (3) cases or shelves where the bulletins can be placed on end

-
- Zoology
 Physics
 Chemistry
 Botany
 Geology
 Biology
 Agriculture
 Forestry
 Horticulture
 Aeronomy
 Educational
 Pharmacy
 Surgery
 Chemistry
 Anatomy
 Physiology
 Farm buildings
 Poultry
 Hays
 Navigation
 Landregrange
 Glassware
 Furniture
 School buildings

colours, are needed. There should be as many white cards as there are articles to be catalogued, and as many coloured cards as there are divisions and subdivisions of the

main subject. For 500 bulletins and reports it is likely that 600 white cards and 60 coloured division cards (15 of one colour, and 45 of another) would be sufficient. For a larger number of publications it would be necessary to procure additional white cards only.

2. A box or drawer, in which to arrange the cards on edge, will be needed. This may be a home-made article, or it may be purchased from any dealer in office furniture and supplies. An uncovered oak tray ten inches long, like the one shown, is admirable for this purpose.

3. Shelves on which to arrange the publications should be about ten inches apart, and should be provided with perpendicular division boards about every 10 to 15 inches to keep the bulletins from falling down. The shelves may be open or they may be enclosed as in a bookcase.

ARRANGING AND NUMBERING THE PUBLICATIONS

Practically the publications issued by the Departments of Agriculture are numbered. The first thing to be done with numbered publications is to place its own number in bold figures in the upper left-hand corner of the first cover page, so that when it is placed on a shelf between other publications its number can be discovered without removing it entirely from the shelf. Reports and other publications without numbers should be given arbitrary numbers, selecting for this purpose numbers that are missing in the collection of bulletins. For example, there may not be a publication numbered 5; if not, use 5 on the first unnumbered publication found and so on with other numbers that are lacking. Or better, such publications may be given decimal numbers, as .01, .02, .03, etc. Clippings may be pasted on a good quality of cardboard the size of a Dominion Department of Agriculture bulletin page, and given numbers in the same series with unnumbered publications.

In case there are several publications containing the same number, as for example, a bulletin from this Department numbered 28 and three or four provincial bulletins, each having the same number, the second of these should be numbered 28-1, the third 28-2, the fourth 28-3, and so on.

Following the numbering of all publications properly comes the placing of them on end in numerical order, reading from left to right, on the shelves of the library or bookcase. In order that time may not be lost in searching for a particular publication, it would be well to label the shelves by hundreds, as 1-100, 100-200, 200-300,

etc., or to put labels in a similar way on the upright division boards.

CATALOGUING THE PUBLICATIONS

One coloured division card should be prepared for each main division of the catalogue. For convenience and simplicity the scheme illustrated in figure 1 is suggested for the public schools. This provides for 10 main divisions, as follows: (1) Educational, (2) agronomy, (3) horticulture, (4) forestry, (5) animal husbandry, (6) dairying, (7) agricultural engineering, (8) agricultural economics, (9) miscellaneous, and (10) sciences. Cards of another colour will serve to subdivide some of the above main divisions, as, for example, agronomy in this classification is divided into farm crops, crop pests, soils, and fertilizers.

With all materials at hand and the division cards made, the next thing is to make a card for each publication.

Bulletin 85, of the Dominion Experimental Farm, may be taken as an illustration of the method of cataloguing each publication. A plain white card (preferably 3 by 5 inches in size) should be used, and on the upper central portion of this the title and author of the publication should be written thus: *Hardy Roses; Their Culture in Canada*, by W. T. Macoun and F. E. Buck. In the upper left-hand corner of the card should be placed the number 85, corresponding to the number in the upper left-hand corner of the bulletin. The date of issue should be placed near the lower left-hand corner of the card and to the right of this the kind of publication and its source, thus: 1915, *Experimental Farm Bulletin*, Dominion Department of Agriculture. The card as completed would appear as follows:

85
HARDY ROSES; THEIR
CULTURE IN CANADA
By W. T. Macoun and F. E. Buck

1915. *Experimental Farm Bulletin*.
Dominion Department of Agriculture.

Similarly the completed card for Bulletin 188, *Weeds of Ontario*, by J. E. Howitt, M. Sc. Agr. and issued by the Ontario Department of Agriculture, would appear as follows;

188

WEEDS OF ONTARIO

By J. E. Howitt, M. Sc. Agr.

1911. Department of Agriculture
Bulletin, Ontario.

The completed card for Bulletin 6, "School Improvement and Arbour Day", published by the Ontario Department of Education would appear as follows:

6

SCHOOL IMPROVEMENT AND
ARBUR DAY1913. Department of Education
Bulletin, Ontario.

The completed card should next be placed in the proper division and sub-division in the catalogue. The subject of the bulletin first mentioned, Hardy Roses, Their Culture in Canada, is evidently one relating to floriculture, hence it would come under "Horticulture," and under the sub-division "Floriculture." There is also a suggestion in the title that the bulletin contains something especially appropriate for rural school work. If, upon examination of the bulletin this is found to be true, it would be well to make

a duplicate white card, to be put under the division "Educational" and the sub-division "School courses", so that one person looking through this catalogue for references to literature relating to school courses would find a reference to this bulletin, while another person who cared nothing about school courses, but who was very anxious to get suggestions for rose culture, would find a reference to the same bulletin by looking under "Floriculture".

In the case of reports containing several articles, a card should be filled out for the subject of each article of interest in the same way that cards should be filled out for individual bulletins or circulars, and each card should be given a number corresponding to the number on the upper left-hand corner of the report. Clippings and very important data found in books should be catalogued in the same manner as just outlined for reports.

A card catalogue on this plan, when once prepared for all the agricultural publications on hand, can easily be kept up to date by simply taking a few moments to prepare cards for each publication as it is received. The saving of time to any one having to refer frequently to a miscellaneous collection of pamphlets would be great, and in the case of a school class in agriculture a catalogue is almost as essential as the publications themselves, for the publications are never used effectively without some good system of filing and cataloguing.

At the opening of each school year, all new students who may have occasion to use the agricultural bulletins should be shown how to use the catalogue and how to find the publications referred to on the cards.

From time to time there is published at Ottawa a list of the publications of the Dominion Department of Agriculture available for distribution. Copies of this list, as well as bulletins, pamphlets, circulars, etc., mentioned therein, can be obtained free of charge upon application to the Publications Branch, Department of Agriculture, Ottawa.

THE TEACHING OF SCIENCE

BY J. F. SNELL, D.Sc., PROFESSOR OF CHEMISTRY, MACDONALD COLLEGE

I have read the article entitled "How Should Science be Taught" reprinted from "Nature" in the February number of THE AGRICULTURAL GAZETTE. As far as the teaching of chemistry in Canada is concerned the criticism quoted does not apply. I believe there is no lack of striking experiments, nor of attempts to relate fundamental principles to everyday life. Even "a study of air and water"

gives scope for both these features. A school course, however, should, and I think usually does, extend beyond the treatment of so limited a number of topics; and the information imparted is by no means confined to what the student can discover in his laboratory course. Laboratory work, nevertheless, has value in at least three directions: (1) it inculcates habits of accurate observation and careful

induction, which are valuable to a man or woman in any walk of life; (2) it instills an appreciation of the methods and difficulties of science; (3) it affords a certain amount of manual training. A good course cannot consist *entirely* of laboratory practice nor can one be given *without* laboratory practice.

The common fault in our teaching is

want of sympathy with the learner's point of view—the attempt to present the science logically as it presents itself to the mind of the philosopher rather than to stimulate the curiosity of the student with respect to familiar phenomena and, having thus secured his interested attention, to lead on to the recognition of the underlying scientific principles.

BY W. L. GOODWIN, D.Sc., DEAN OF QUEEN'S UNIVERSITY

THE writer of the article on "The Teaching of Science," republished from "Nature" in the February number of THE AGRICULTURAL GAZETTE, hits upon the weak point in our attempt to teach science.

I think the secret is in the teachers and writers of text books. They do not seem to be able to make connection between the ordinary experiences of our daily life and the facts and methods of science. This may be due to their own lack of experience and acquaintance with practical life itself. Whatever is the cause the method of presentation is commonly so detached that young people quickly lose interest in the subject. Once lost, it is very hard to arouse the interest again. It is quite a common experience with university teachers to be told by first year students that they do not like physics or chemistry, or whatever the science is. Afterwards many of them find that they do like the subject because they have found a new view point.

REQUIREMENTS OF MODERN LIFE

The writer states what should be a self-evident truth, in the words "Modern life requires that the elements of scientific method and knowledge should form part of every educational course." This is a kind of common sense which should commend itself to every educational list; but I am sorry to say that many of our leaders in both university and secondary education are so wedded to their idols that they have failed to grasp the meaning of science in relation to modern life. Still, in my opinion, the chief weakness is in teachers of science themselves. They commonly attempt to teach beginners a great many times as much as they can possibly digest, instead of the scientific method with a small amount of material thoroughly studied. It is quite common for them to range over the whole subject, studying laws and theories which should be

left for a later period, and heaping up such a mass of facts that thoroughness is out of the question. It is quite evident that in teaching of science we have not learned the lesson of the classics, the educational value of which is dependent, not upon its being Latin and Greek, but upon the method of study,—the product of hundreds of years of development.

It is astonishing that we teachers of science have done so little in our subject, when we consider the elements of wonder and interest in them for the average boy and girl. Until we learn to keep close on the trail of a student's natural curiosity and interest we shall go on with the failure.

THOROUGHNESS AND SCIENCE

The writer puts the situation very concisely when he says, "It is even more important to present the view of science which should be human as well as precise." But I may add that it is just as important to be precise as it is to be human, in the presentation of science. With the common lack of interest in students of science, one usually finds a most painful lack of precision which shows itself both in the use of words and in the details of manipulation. We have had this characteristic of our failure in education painfully pressed home upon us in the war which is now going on. Our enemies beat us because of their thoroughness, and of their use of a scientific imagination which is always on the alert and always quick to see and seize upon some new way of attacking us. In other words, they use the trained, experienced brain, where we trust to the amateur. Before the war broke out they were beating us in many fields of trade and commerce for the same reason. If we are to hold our own as a race we must take a more common-sense view of the relation of scientific education to our life and interests. Science is simply organized knowledge. It should be sufficient to state that fact to commend it to all.

BY R. HARCOURT, B.S.A., PROFESSOR OF CHEMISTRY, ONTARIO AGRICULTURAL COLLEGE

THERE is much truth expressed in the criticism that appears in the February issue of THE AGRICULTURAL GAZETTE with respect to the teaching of Science, but we must remember there has been a wonderful development in the whole realm of science in the last quarter of a century, and in our modern colleges there are now three, four, or a half-dozen men in a department of science that was formerly handled by one man. With the greater development of the subject more time is being spent in studying the facts upon which the interesting phenomena depends. In the whole course of the subject as many or more interesting points are developed, but they are necessarily diluted, as it were, by the less interesting detail, which should lead to a better understanding of the subject, and, consequently, to the fuller application to every day life. It is at this point that it is to be feared many teachers fail in their opportunity. They teach the theory and overlook the application to the common things about them. Possibly this is a result of the too rigid courses in our progressive system of education.

It is in the high schools and collegiates that the criticism is most true. In order that there may be a systematic develop-

ment of every branch of science, certain branches of the subject are assigned to the preparatory schools leading to the university. When we remember that only a small percentage of the students in these schools go on to the colleges and universities, we recognise that if more attention was given to the attractive side of the sciences and students were shown interesting experiments and thus attention drawn to remarkable facts and phenomena more interest would be aroused in the subject, and a more lasting result be obtained. But, if the data upon which the theories of science are based are ever to be taught it must be in our colleges and universities; that is what many of the students enter these institutions for, and it is through the study encouraged here that the great advancements have been made in science.

In this institution the criticism does not hold good, for every effort is made in all the departments of science to draw from science everything that will aid agriculture. The theories and laws in biology, physics and chemistry are taught; but the real reason for studying these subjects at an agricultural college is never lost sight of and every effort is made to apply the sciences to the problems of the farm.

BY WM. H. DAY, PROFESSOR OF PHYSICS, ONTARIO AGRICULTURAL COLLEGE

SO far as this criticism relates to the teaching of Physics in Ontario schools, I am at a loss to see how it applies to any appreciable extent. In consulting the Regulations of the Department of Education, page 32, I find the following prescribed for the Lower School: "Elementary Science. First Year: Botany, Zoology and Physics—An elementary, practical course. Second Year: The course of the first year continued, with an introductory course in Chemistry." Here is scope for "interesting experiments to encourage the pupils to read about remarkable facts and phenomena in nature". And by enquiry at one Collegiate Institute, I find this elementary course handled in this manner in so far as the equipment of the school permits, and it seems but reasonable to assume that these facilities are better than twenty years ago. This course is not compulsory, but is actually taken by all pupils of the First and Second Forms in the above Collegiate Institute. It is believed this is virtually true in most High Schools and Collegiates.

In the Collegiate Institute above referred to 80 per cent of the pupils continue their studies and enter the Middle School or Form III. The Physics laid

down for this form is given on page 37 of the Regulations as follows: Physics—An experimental course outlined, with experiments in detail, under the following heads: Heat, Sound, Light and Electricity and Magnetism. The pupils of the Middle School are of three classes:

Class I—Those intending to write for Teachers' Certificates.

Class II—Those intending to write the Matriculation Examination for entrance into one of the universities.

Class III—Those not intending to write examinations. This last is a very small percentage.

For Class I the course in Physics is compulsory. For Classes II and III it is optional. In actual practice in this particular school it works out that over 95 per cent of the pupils in Form III take Science, including the four branches of Physics above mentioned.

In this same Collegiate when the work of Form III is completed about 40 per cent enter the "Upper School" or Form IV which leads to Honour Matriculation and the Faculty of Education. The Physics course is outlined on page 40 of the Regulations under the following subjects:

Mechanics, Properties of Matter, Flow of Fluids and Related Phenomena, Surface Tension and Capillary Phenomena.

Over 95 per cent in this form take Science.

From this resumé it will be seen:

1st. That most, if not all, pupils attending High School or Collegiate Institute take Elementary Science for two years, a course which appears to meet the desires of the author of the quotation in providing

demonstrations of interesting experiments and phenomena.

2nd. That of those in attendance in the Third and Fourth Forms, about 95 per cent actually take Physics. This furnishes the detailed knowledge of the different branches of Physics.

In view of these conditions there seems, as I said in the beginning, little, if any, ground for the criticism so far as the teaching of Physics is concerned.

THE TEACHING OF ELEMENTARY AGRICULTURE

THE OLD METHOD

THE old method of teaching agriculture is by means of books. The teacher prescribes certain pages, or a certain chapter as a lesson to be learned. Such is the book-method. This method never makes the subject interesting to the pupils and generally evokes criticism and contempt if the schools attempt to give instruction in this subject. It may make "book-farmers", but its instruction often does not harmonize very well with that gained by our farmers in the hard school of experience.

THE NEW METHOD

The new method bases its instruction on observations in nature and experiences in the school garden. It is the natural, experimental, scientific method. It is the method by which the practical farmer learns his agriculture.

It does not aim primarily at giving our pupils a large fund of technical agricultural knowledge. Its chief aim is to awaken interest in the every-day activities of the farm-home and create a desire for further information concerning them.

It trains the pupils to be observant and inquisitive about farm operations and inspires them to read for further information. It uses the interests of the home in directing the education of the child; the activities of the school are wholly determined by the interests of the home.

It does not send the pupils to the book. It collects first a fund of information based upon the child's every day experiences, creates a desire for greater experience and fuller information. The pupil then seeks the book to confirm and to supplement the information he himself has obtained. The teacher is the presiding genius, the child's guide, learning as well as working with him; the teacher is more than a mere instructor, the child is more than a mere pupil.

SUGGESTIONS FOR TEACHING AGRICULTURE

1.—Have a definite place on the time

table, say twice a week, perhaps the last period of the day.

2.—At each lesson, announce the topic for the next.

3.—Let each lesson consist in collecting answers and results of certain problems and experiments; try to have all information presented the result of individual investigation or experience.

4.—In gardening work, direct the pupils to do certain work in order to learn certain truths, e.g., the effects of thinning and tuck on rows of carrots, radishes, lettuce.

5. Use observations on neighbourhood activities and results of gardening experiments in arithmetic, composition, spelling, geography, literature, drawing, book-keeping and supplementary reading.

6. Secure outside help; have friends of the school address the children on agricultural topics, such as: growing vegetables; the planting and care of trees, the feeding and care of stock, etc. Visit the best local farms at suitable seasons.

7.—Direct the reading of the children to books and bulletins that will arouse interest in community-welfare. Use this information in oral and written composition and in debates.

8.—Have the children keep agricultural note books in which to record neatly the results of experiments and the lessons learned.

9.—Arrange a school improvement club and train the pupil to prepare programmes for Friday afternoons; such programmes should include debates or discussions of topics of rural interest such as good roads, rural mail delivery, rural telephones, fire protection, etc. Invite the parents to the Friday meetings.

TOPICS FOR DISCUSSION IN RURAL AND VILLAGE SCHOOLS

During the winter months there is less work in nature study and school gardening to be done than during the summer months.

The interest, however, should not be allowed to wane. There are many topics of vital importance to every rural and village home that may and should be discussed with the children at school. The following list is suggestive:—

Good Roads, Rural Mail Delivery, Rural Telephones, Suburban Electric Railways, Protection of Birds, Protection of Forests, Protection of Game, Protection from Prairie Fires, Good Water Supply, Ventilation of the House, Ventilation of the Stables

Sanitation of the House, Sanitation of the Stables, Drainage about Farm Buildings, Wind Breaks, value, how to plant, Trees—value, how to plant, care, School Trustees—how elected, duties, Municipal Councils, how elected, Consolidated Schools, Agricultural Societies, Home Economic Societies, School Fairs, Boys' and Girls' Clubs, Arbor Day, School Picnics.

From Manitoba Department of Education Bulletin.

THE PRESERVATION OF BIRD LIFE

IN view of the rapidly increasing interest being taken in the preservation of Canadian birds and the movement to provide suitable nesting quarters, the following article has been prepared for THE AGRICULTURAL GAZETTE by W. J. Warters, Director of Technical Education in the Public Schools of Winnipeg, dealing with the work of the boys in the Manual Training classes, in the construction of bird houses:



TYPES OF BIRD HOUSES CONSTRUCTED BY BOYS IN THE WINNIPEG PUBLIC SCHOOLS

"Our scheme for interesting our boys of Grades V, VI and VII in the bird life of the province is only in its initial stage, and I have not very much information of real value to give.

"It was only last year that we first attempted anything of this kind, and although unorganized the partial success met with inspired us to greater effort.

"In January last I issued a circular asking the Manual Training teachers to give ample notice to their pupils that the first week in March would be devoted to the provision of bird houses to be constructed from material entirely provided by themselves.

"Two simple plans were shown and explained, but the adoption of these were not encouraged. The object of the proposed house was fully explained and the boys were asked to practise their ingenuity and skill in providing such a nesting home

as would prove irresistible to a father and mother when they were searching for weather-proof quarters in which to bring up a family. It must be decorated to attract the bird, no gaudy colours, but just a simple little home that seems to belong to the natural surroundings, in which it was proposed to place it.

"The resulting accumulation of materials showed excellent judgment, and bark, mosses, twigs, split willow branches to be afterwards used in all kinds of design and usefulness were quickly stored. The birch, oak and jack pine in the local cordwood yards were stripped of their outer covering, the dealers entering into the spirit of the game, in many cases assisting to obtain suitable materials. Whole logs of pine and tamarac were sawn and split, the centre scooped out and suitable roof and flooring provided to restore it to its woodland appearance

and make it a comfortable residence for a bird family.

"One half day proved all too short for the busiest period ever experienced in our rooms, and the houses were eagerly carried home to be finished. At least 1,500 of these have been brought back for the approval of the teachers. Exhibitions were arranged in some of the schools where the Manual Training centre is

bird life. Birds, other than those that nest in covered spaces, might be provided for; boys and girls encouraged to study their habits developing an attitude towards them of untold value in the preservation of bird life of the future. Some of our authorities on bird life might well devote thought and time to devising shelter pockets and hanging receptacles suitable for particular varieties and thus



DISPLAY OF BIRD HOUSES MADE BY BOYS OF THE WINNIPEG PUBLIC SCHOOLS

situated and great enthusiasm was aroused among the younger children, many of whom, both boys and girls, brought houses constructed at home, showing not only exceptional skill in construction, but wonderful ingenuity in providing such a home as would be attractive to a bird.

"Much remains to be done to meet the possibilities presented by the needs of

giving new impetus to a movement still in its infancy.

"I am arranging to obtain photographs of as many of the houses as possible after they are occupied, and I hope by this means to discover what form seems most desirable from the birds' point of view and to arouse a new interest to push forward our effort of next year."

A PUBLIC SCHOOL COW

WE have been accustomed to look to some of the states of the republic to the south for what might be called "freak" movements for the advancement of agriculture. But all the unusual things do not happen there. In Scotland there has been introduced what is known as the public school cow. A gentleman, interested in the training of children for farm life, has presented a cow to the public school at Kelso. The cow has grazing pasture near the school. The pupils learn under expert teachers how to feed this cow, milk her in sanitary fashion, how to care for the milk, set the cream, skim it, and make it into butter. A little model dairy of a simple kind is fitted up in the school. It is a little demonstration farm, as it were,

in the school, and the results, as reported, seem to be very satisfactory. The children are delightfully interested in their school work, and are growing up under a strong inclination to stick to the land. And further, the children at this school are reported to be keeping their regular school work up to the standard and doing better than most of the ordinary schools in Scotland not blessed with a public school cow. Besides this, the cow is a money-maker for the school. The butter and by-products sold bring a good price. Following the story further, one can readily imagine how interested the pupils of this school are in their cow: How its every movement is watched, how much milk she gives, how much butter is made, and what it sells for.

Then there is the feeding and caring for the cow. Everything done will be told to the folks at home. And one can imagine a spirit of rivalry developing among the farmers of the district to have their cows

do as well as the school cow and to have their butter sell for as much as the school butter.—*From Canadian Farm, Toronto, April 14th, 1916.*

FARM MANAGEMENT DEMONSTRATION WORK

FARM Management Demonstration Work is making rapid progress in the United States. At a recent annual Conference of Farm Management Demonstrators, held at St. Louis, twenty States were represented.

Farm Demonstration Monthly issued by the United States Department of Agriculture points out that after a thorough discussion of the past year's work, the demonstrators found themselves in almost perfect accord regarding the following features:—

1. That demonstrations in farm management should be conducted only in areas having a local leader who will support the work and take an active part in conducting it.
2. That a project agreement covering the work in detail should be signed by (a) the county agent or other local leader, (b) the representative of the farmers' organization in the county, (c) the farm management demonstrator, and (d) the extension officials of the state college of agriculture.
3. That in accordance with this project agreement the local leader should make the necessary preliminary plans, assist in taking records, help make computations and tabulations, and return most of the records to the farmers, as well as do the follow-up work.
4. That before returning the business analyses to the farmers the general results of the work should be presented to the community through public

meetings, press articles, personal conferences, and by such other means as seem practical.

5. That the analysis of the business of each farm in comparison with average of other farms in the community should be returned to its operator personally, so that he may have the opportunity of fully discussing this comparison and be encouraged to make such changes as seem to be desirable to increase his farm profits.
6. That the keeping of simple farm accounts is very important and that each farmer should be assisted in keeping such an account book as will meet his needs.
7. That the county agent should keep in touch with those farmers whose business has been analyzed and counsel with them from time to time regarding any changes which they have made or contemplate making.
8. That an area report in the form of a demonstration circular is a very desirable means of leaving a record with each farmer whose farm business has been analyzed and of presenting general results to the farmers throughout the country.
9. That each demonstrator should have at least one good clerk who can care for the office work in his absence and direct other assistants in the computations and tabulations, and that good adding and computing machines, as well as efficient filing facilities, should be a part of every office's equipment.

SOCIETIES AND ASSOCIATIONS

THE PRINCE EDWARD ISLAND EGG AND POULTRY ASSOCIATION

The annual meeting of the Prince Edward Island Egg and Poultry Association was recently held in Charlottetown. Addresses were delivered by Hon. Murdock McKinnon, Commissioner of Agriculture, P.E.I., Mr. H. S. Arkell and Mr. W. A. Brown of the Live Stock Branch, Dominion Department of Agriculture, Rev. Dr. Gauthier, P.E.I., and others.

The officers elected for 1916 were: Hon. President, Hon. Martin Burrell, Minister of

Agriculture; 1st hon. vice-president, John Bright, Live Stock Commissioner for Canada; 2nd hon. vice-president, Lieutenant-Governor McDonald; 3rd hon. vice-president, Hon. Murdock McKinnon; president, Rev. P. P. Arsenault, Mount Carmel; 1st vice-president, E. Bulpitt, Cardigan; 2nd vice-president, J. B. Millman, Long River; 3rd vice-president, Rev. Dr. P. C. Gauthier, Palmer Road.

THE PRINCE EDWARD ISLAND DEVELOPMENT COMMISSION

AS a result of a Provincial Conference held on March 7th, at which a large representative general committee was appointed, the Prince Edward Island Development Commission was formally organized in Charlottetown by the Committee on April 11th and 12th. The following adopted by-laws outline the purpose and scope of the new organization:—

1. This organization shall be known as the "Prince Edward Island Development Commission."

2. The object of the Commission shall be to enquire into, discuss and make suggestions and recommendations regarding any matters pertaining to the welfare and development of this province.

3. The Commission shall consist of twenty members who were appointed by the Conference held on March 7th, 1916, viz., eight members from Queen's county; six members from Prince county; and six members from King's county; eight members to form a quorum.

4. The Commission shall elect from among themselves, a president and three vice-presidents, one from each of the counties. They shall appoint a secretary.

5. The duties of the Commission shall be to take such action as it deems necessary to carry out the purpose for which it was organized and for this purpose shall have power to appoint sub-committees; which sub-committees may be empowered to associate with themselves such experts as they may deem advisable.

6. The Commission shall have power to fill vacancies caused by death, resignation or otherwise.

Sub-committees in accordance with section five of the foregoing were appointed to deal with agriculture; education; fisheries; new industries; undeveloped resources; immigration, and transportation. The

agriculture committee will take up the following lines of work: Aid to dairying, strawberry and raspberry culture, co-operative buying and selling, community breeding of live stock, drainage of farm lands, growing small seeds, noxious weeds. The education committee will deal with: System of high schools, better salaries for teachers, rural science, technical education. The new industries committee have named the following subjects to receive special attention: Manufacture of glass (an excellent deposit of sand for this purpose being found at Souris); the use of mosses as antiseptics and other purposes; the utilization of sea weeds; the toy industry, etc. The transportation committee will devote their attention to the following subjects:—

The I. C. R. authorities will be communicated with, with a view of having closer connection day and night with through trains from Halifax to the West for mails and passengers when the car-ferry begins running; cold storage for fish and meat, dairy products and fruits; heated cars for fruits and perishable products in winter; special rates for distributing centres, better transportation facilities with Newfoundland; steamboat transportation and development of trade with the West Indies; that a committee nominate a Prince Edward Islander to be appointed by the Government to investigate trade and commerce with the West Indies, and to report upon the requirements of these markets; the need of improving facilities at certain shipping points on the Island, such as Breadalbane, Montague, etc. The Government will be asked to macadamize the approaches to these as quickly as possible; the automobile problem.

The general committee consists of the following: F. R. Heartz, president; Rev. Dr. Gauthier, Palmer Road; A. J. McFadyen, Tignish; R. T. Holman, Summerside;

J. W. Callbeck, Summerside; J. D. Stewart, Georgetown; N. Rattenbury, W. F. Tidmarsh, Percy Pope, J. O. Hyndman, Dr. W. J. P. MacMillan, P. W. Clarkin, Charlottetown; Franklin Bovyer,

Bunbury; Leslie McNutt, Malpeque; J. A. MacDonald, Cardigan; W. P. Callaghan, St. Louis; W. L. Poole, Montague; F. Mellish, Union Road, J. Aeneas MacDonald, D. B. MacDonald, Souris.

THE NEW BRUNSWICK BEE-KEEPERS' ASSOCIATION

THE New Brunswick Bee-keepers' Association met in annual convention at Fredericton on March 2nd. Mr. L. T. Floyd presided. The president's address spoke of good crops of honey, good markets, and a greatly increased demand for the products of the bee. The secretary-treasurer reported a membership of fifty-three. He also reported that several hundred dollars worth of supplies had been purchased through the Association by its members at a considerable saving to themselves. The Provincial Apiarist, Mr. H. B. Durost, told of

a greatly increased interest in bees. Many inquiries for bees, and for information re their care, were being received from all parts of the province. Mr. F. W. L. Sladen, Dominion Apiarist, delivered an interesting address on general beekeeping practice. The election of officers resulted as follows:

President, L. T. Floyd, Central Norton; 1st vice-president, David Hiscoe, Fredericton; 2nd vice-president, G. S. Peabody, Woodstock; secretary-treasurer, H. B. Durost, Woodstock.

NEW BRUNSWICK POTATO GROWERS' CONVENTION

At the call of Prof. G. C. Cunningham, Plant Pathologist of the Federal Department of Agriculture, in charge of the Fredericton laboratory, a convention of the potato growers of the province was held on March 22nd and 23rd at the Fisher Vocational School, Woodstock.

A feature of the convention was the display of the Dominion Experimental Farms agricultural exhibit, together with 60 varieties of potatoes grown and tested at the experimental station, Fredericton.

Addresses were delivered on the subject of potato-growing and its very many phases by Prof. G. C. Cunningham, Prof. Wm. Stuart, horticulturist in charge of potato investigations, Washington, D.C., Prof. W. T. Macoun, Dominion Horticulturist, Mr. W. W. Hubbard, Supt. Fredericton Experimental Farm, Mr. J. B. Daggett, Secretary for Agriculture, and others.

At the conclusion of the convention the New Brunswick Potato Growers' Association was officially organized, a constitution

adopted, and the following officers elected: President, Mr. T. W. Caldwell, Florenceville, N.B.; vice-president, Mr. Donald Innes, Tobique River, N.B.; secretary, Prof. G. C. Cunningham, Fredericton; treasurer, Mr. W. H. Moore, Scotch Lake, N.B.; Auditor, Mr. C. M. Shaw, Hartland, N.B.

The object as stated in the constitution is to assist in the dissemination of knowledge on methods of cultivation, suitable varieties, seed improvement, grading and standardizing, marketing, eradicating and controlling fungous diseases, and other allied subjects.

The association shall hold an annual convention and shall provide a special programme of topics related to the potato industry, and it is recommended that a potato exhibit be held therewith. It is further recommended that the association send an exhibit to the Canadian National Exhibition, Toronto, and maintain a booth on the exhibition grounds.

COUNTY BEE-KEEPERS' ASSOCIATIONS IN ONTARIO

THERE have been organized in the province of Ontario twenty-seven county Bee-keepers' Associations affiliated with the Ontario Bee-keepers' Association. They are situated in the following counties: Brant, Carleton, Elgin, Essex, Glengarry, Leeds & Grenville, Grey, Haldimand, Halton & Peel, Huron, Kent, Lambton, Lennox & Addington, Lincoln & Welland, Middlesex, Norfolk, Northumberland, Oxford, Prince Edward, Renfrew, Russell, Simcoe, Stormont, Victoria, Well-

ington, York, Toronto.

These Associations are independent organizations, but all of them have seen fit to affiliate with the Provincial Association. In order to affiliate, the County Association is required to pay an annual fee of \$5 and have at least ten members who belong to both Associations. Memberships are accepted from the county by the provincial association at seventy-five cents and an annual grant of fifty cents per member is returned to the county associa-

tion from the provincial. Previous to last year the annual grant of the provincial association was a lump sum of \$300 divided equally amongst all the affiliated societies whether their membership was large or small. Since the last annual convention of the provincial association the grants to county associations are based on membership. The benefits of membership in federated county associations are given as follows: An annual subscription to the "Canadian Horticulturist and Bee-keeper"; timely reports on the honey crop and what prices to ask; the three days annual con-

vention held at Toronto in November; the privilege of securing Italian queens at co-operative prices, and many other benefits of organization.

The first Ontario county bee-keepers' association was organized in Norfolk County in 1870. The last to be organized was at Renfrew in March of the present year. The more recently formed associations have been organized by the agricultural District Representatives with the assistance of the Provincial Apiarist, Professor Morley Pettit.

THE SASKATCHEWAN LIVE STOCK ASSOCIATIONS

BY P. F. BREDT, ACTING SECRETARY

THE annual meetings of the Live Stock Associations of Saskatchewan took place in Regina at the time of the Winter Fair, and many matters of importance to stockmen were discussed. It seemed to be the opinion of all the associations that the Winter Fair was not the most suitable time for the holding of the annual meetings, and each association passed a resolution recommending a change of date. In many cases members of the different executives were themselves exhibiting at the fair, and could not afford the time they would have liked to devote to the affairs of their respective associations.

THE HORSE BREEDERS' ASSOCIATION

At the Horse Breeders' meeting President Taber spoke on several topics of interest to horsemen, such as the buying of remounts and federal aid to horse breeding. Dr. Creamer gave an interesting address on the latter subject, pointing out the difference between the loan of stallions and the assistance given by the payment of part of the service fees under the federal scheme. It was resolved that an annual sale of pure bred horses should be held at the time of the Winter Fair.

The following officers were elected: President, R. Sinton, Regina; vice-president, H. Gilmour, Pasqua; directors, A. Mutch, Lumsden; A. A. Downey, Arlington Beach; Peter Horn, Regina. Mr. R. H. Taber was appointed representative of the association on the Stallion Licensing Board.

THE SHEEP BREEDERS' ASSOCIATION

At the meeting of the Sheep Breeders' Association, President Potter spoke of the bright prospects for sheep breeders, the strong demand even now for breeding sheep, and the continued high price of wool. A resolution was passed recom-

mending that a fall sale be held again this year.

The following officers were elected: President, E. E. Baynton, Bigstick Lake; vice-president, F. T. Skinner, Indian Head; directors, J. L. Beattie, Piapot; C. A. Logan, Tuxford; H. Follett, Duval.

THE CATTLE BREEDERS' ASSOCIATION

At the Cattle Breeders' Association meeting much time was given to a discussion of the regulations and conduct of the sales, and several decisions were arrived at which will make these more valuable and convenient in many ways in future.

The following officers were elected: President, J. G. Robertson, Davidson; vice-president, J. W. Barnett, Moose Jaw; directors, W. C. Sutherland, Saskatoon; A. B. Potter, Langbank; J. Brandt, Edenwold.

THE SWINE BREEDERS' ASSOCIATION

The Swine Breeders' Association meeting was not a very representative one. After President Tomecko's opening address, several resolutions were passed. A discussion took place on the subject of local markets and abattoirs, the members being in favour of their establishment as soon as possible. It was recommended that sales should again be held this year both at Regina and Saskatoon. Some millers were found to have been selling shorts and other hog feeds filled with underground seeds of noxious weeds. This practice was condemned by resolution and the Minister of Agriculture asked to take steps to prevent any repetition of this offence. The meeting also strongly disapproved of the railways charging 75 cents for cleaning stock cars whether this service was performed or not, and favoured calling the attention of the railway commission to the matter.

The following officers were elected: President, A. B. Potter, Langbank; vice-president, W. C. Sutherland, Saskatoon; directors, S. V. Tomecko, Lipton; H. Follett, Duval; R. M. Douglas, Tantallon.

The meeting of the joint executive of the Live Stock Associations confirmed the ideas of the separate organizations as to the time and place for the annual meetings, and considered it might be well to accept the invitation of Dean Rutherford to hold them at the University. A motion to the effect that the annual meetings of the Live Stock Associations be held at the Uni-

versity in Saskatoon next year was passed unanimously.

It was thought advisable to choose a date on which no other convention was to be held, except perhaps the Dairymen's. A committee was appointed consisting of the Presidents of the four Live Stock Associations and of the Stock Growers' Association at Moose Jaw, Dean Rutherford and P. F. Bredt, the Secretary of all the Live Stock Associations, to arrange the date and programme for a live stock convention week, which will include the meetings of these associations.

THE ALBERTA CATTLE BREEDERS' ASSOCIATION

The annual meeting of the Cattle Breeders' Association of Alberta was held in Calgary, April 11th. The officers elected for 1916 were: Hon. president, Hon. Peter Talbot, Lacombe; president, James L.

Walters, Clive; 1st vice-president, Wm. Sharpe, Lacombe; 2nd vice-president, Thos. Laycock, Calgary; secretary, E. L. Richardson, Calgary.

THE SOUTHERN ALBERTA WOOL GROWERS' ASSOCIATION

The annual meeting of the Southern Alberta Wool Growers' association was held recently and the members decided to accept the offer of the Dominion Department of Agriculture, to grade their wool clip this year. In order to comply with the requirements the association was re-

organized so that the clip can be marketed by the association on a co-operative basis. The following officers were elected: President, E. Harker, Magrath; vice-president, J. T. Heninger, Welling; secretary-treasurer, C. T. Crest, Lethbridge.

THE ALBERTA WOMEN'S INSTITUTES

The second annual convention of the Women's Institutes of Alberta was held in Edmonton early in March; the 250 delegates in attendance coming from every part of the province. Addresses of welcome were delivered by Lieut.-Governor Brett; Premier Sifton and Minister of Agriculture, Hon. Duncan Marshall. Among the many subjects under discussion the following were given a prominent place: canning clubs, school contests, Red Cross work, rural school problems, poultry, etc. The progress being made is very clearly demonstrated in the following statement

from the address of the Superintendent, Miss Mary McIsaac: "In January, 1915, our branch Institutes numbered 42, with a membership of 1,400. To-day we have 107 branch Institutes and a membership of 3,000 women, an increase of 65 branches and 1,600 women."

The election of officers for 1916 resulted as follows: Hon. president, Mrs. Duncan Marshall, Olds; president, Miss Isabel Noble, Daysland; 1st vice-president, Mrs. Fleming, Merna; 2nd vice-president, Mrs. Mackenzie, Nightingale; secretary-treasurer, Mrs. Muldrew, Red Deer.

THE ALBERTA AGRICULTURAL FAIR'S ASSOCIATION

THE annual convention of the Alberta Agricultural Fairs' Association was held at Edmonton on March 1 and 2, 1916. The total attendance was 125, and consisted of delegates from the Agricultural Societies and Exhibition Associations of the province. Interesting and instructive addresses were delivered by Hon. A. L. Sifton, Premier of Alberta; Hon. Duncan Marshall, Minister of Agri-

culture; H. A. Craig, B.S.A., Deputy Minister of Agriculture; A. Galbraith, Superintendent of Fairs and Institutes; J. Bracken, B.S.A., Professor of Field Husbandry, University of Saskatchewan; E. A. Howes, B.S.A., Dean, Alberta College of Agriculture; Hon. J. R. Boyle, Minister of Education, and others.

Mr. E. L. Richardson, secretary and manager of the Calgary Exhibition Asso-

ciation and the Calgary Spring Horse Show, explained to the meeting a new system of distributing prize money at exhibitions. The system provides for the placing of all breeds on the same basis, and the awarding of prizes in each section

according to the number of entries. By this system the prizes increase in number as well as in value as the entries increase in a class. The following is a scale worked out for the awarding of prizes in the cattle classes at the Calgary Exhibition.

PRIZES AND VALUE

Total Value	No. of Entries to Qualify	1	2	3	4	5	6	7	8	9	10	11
\$ 15	1 or 2	10	5									
20	3 or 4	12	8	5	R.							
34	5 or 6	15	12	7	5	R.						
66	7 or 8	20	18	15	8	5	R.					
83	9 or 10	25	20	15	10	8	5	R.				
113	11 or 12	30	25	20	15	10	8	5	R.			
148	13 or 14	35	30	25	20	15	10	8	5	R.		
188	15 or 16	40	35	30	25	20	15	10	8	5	R.	
233	17 or over	45	40	35	30	25	20	15	10	8	5	R.

The same principle is applied to the horses, sheep, swine and poultry classes.

The prizes offered according to the above table provides that \$13,000 will be paid for prizes for horses, cattle, sheep, swine and poultry. The amount offered in the tabulated lists in each department is based on an estimated amount of \$5,000 each for horses and cattle, and \$1,000 each for sheep, swine and poultry. If the amount won in these five departments, together with the value of special prizes, does not total \$13,000, the balance will be paid pro rata to the prize winners and reserve ribbon winners (except in specials, championships and where otherwise stated) in these departments on the basis of 35 per cent each to the horse and cattle departments, and 10 per cent each to the sheep, swine and poultry departments.

Where the amount offered as per tabulated list is increased for teams, herds, pens, flocks, etc., the added prize money will be on the same basis as classes where no increase had been made to the tabulated list. An award in either case will count as one in distributing added money.

Except in specials, championships and

where otherwise stated, prizes will be paid on the basis shown in the tabulated list of prizes given in each department according to the number of entries actually shown in each class. Not more than three entries may be shown in any class by the same exhibitor.

Mr. Richardson advised the meeting that this system of distribution of prize money has been adopted by the Calgary Exhibition Association, the Calgary Spring Horse Show and the Spokane Inter-state Fair. It is stated also that practically every fair in Alberta will this year give it a trial in some department, while some of them will adopt it in its entirety.

Resolutions were passed dealing with the extension of the hail insurance season, and with the formation of a Dairy Short-horn Breeders' Association and the establishment of a herd book for the association.

The election of officers resulted as follows: Hon. President, Hon. Duncan Marshall; Hon. vice-president, H. A. Craig; president, E. L. Richardson, Calgary; vice-president, Capt. H. J. Angell Evans, Lacombe; secretary-treasurer, E. J. Fream, Calgary.

THE BRITISH COLUMBIA FRUIT GROWERS' ASSOCIATION

THE twenty-sixth annual meeting of the British Columbia Fruit Growers' Association was held in Victoria on March 6th and 7th, when matters of interest to the industry were discussed. There was a spirit of optimism prevalent at the meeting over the increased duty on apples, for the British Columbia Growers will be competing on an equitable basis with the importations from across the line.

There was also a strong feeling that the

association should become more self-dependent and should, in so far as it is possible, stand by itself and not to lean so readily on the government. This was brought to the front when the question of representation was discussed.

A committee was appointed to look into this matter and to report to the executive, for it was stated that representation was not equally divided. Small growers had the same voting power as delegates from

affiliated associations, and hence the discussion.

The standardization of packages was dealt with in an able manner by A. H. Flack, chief fruit inspector for the prairie provinces and a committee was appointed to go into the matter. Edwin Smith of Grimsby, Ontario, spoke on the pre-cooling and the long distance shipment of fruits. Others who addressed the convention were R. C. Abbott, Coasts Market Commissioner, F. D. Nicholson, and W. E. McTaggart, Prairie Markets Commissioner.

The officers elected for the year are as

follows: President Thos. Abriel, Nakusp; vice-president, R. M. Palmer, Cowichan Bay; executive, J. R. Reekie, Kelowna, Jas. Rooke, Grand Forks, and Geo. Heggie, Vernon.

Wm. E. Scott, the Deputy Minister of Agriculture addressed the convention and told of the brighter outlook just ahead for the fruit-growers. Premier Bowser explained the workings of The Agricultural Aid Act and said that over one million dollars would be available for loans at a rate of interest less than 7 per cent, very soon.

THE CONVENTION OF THE BRITISH COLUMBIA FARMERS' ASSOCIATION

The most representative and interesting convention of farmers ever held in British Columbia closed on March 10th in Victoria after a three days' session. A large number of resolutions were brought up dealing with agricultural matters of greater and less importance to the farmers of the province. Dr. Wesbrook, president of the British Columbia University, and Dean Klinck, head of the College of Agriculture of the same institution addressed the farmers and told them of the benefits to be derived from a seat of learning such as is being established in British Columbia.

Wm E. Scott, Deputy Minister of Agriculture, and Premier Bowser told of the government's assistance to the agricultural development of the province and how the Agricultural Credits' Bill would place at the disposal of the farmers' capital with which to proceed with their operations on a business-like basis. Alex. Lucas,

M.L.A., also addressed the meeting and reviewed the workings of such a bill in New Zealand.

The convention was characterized by the independence of the farmers and of their zeal to help themselves. In discussing co-operation, it was a noticeable fact that the delegates were conversant with the general principles of similar organizations. That the farmers of British Columbia are alive to their opportunities was manifested by the earnestness with which they discussed the bigger ideas of farming, and of their live interest in the co-operative marketing of their produce.

The following advisory board of six members was elected: Alex. Hamilton, Fisherman's Cove; J. E. Vick, Pender Island; R. McBride, Richmond; J. Bailey, Sardis; J. R. Brown, Vernon; D. D. Munroe, Terrace.

THE BRITISH COLUMBIA ENTOMOLOGICAL SOCIETY

The annual meeting of the British Columbia Entomological Society was held at Victoria on March 11, 1916. Mr. R. C. Treherne, B.S.A., Secretary of the Association, reports a very successful meeting at which many topics of interest were discussed through the medium of papers and addresses by officers of the Provincial and Dominion Entomological Branches. This society is endeavouring to accomplish two things as follows:

1. To assemble facts of scientific interest to the Entomological work relative to British Columbia.

2. To be the medium of advice to the

fruit-growers in the matter of insects of economic importance. Two sets of bulletins are issued one covering the systematic, scientific papers, and the other covering the economic or practical issues involved in the science.

These bulletins are distributed to the members of the farmers' institutes and the fruit-growers' association of the province. Twice a year, meetings are held at different points, with the object in view of discussing matters together. In this way the association is endeavouring to fill its place in the economic status of things.

THE STOCK BREEDERS' ASSOCIATION OF BRITISH COLUMBIA

The British Columbia Stock Breeders' Association met in Victoria on March 13th and 14th. The sessions were given over to addresses which were delivered by Dean Klinck, of the Agricultural College of the British Columbia University, Dr. F. S. Tolmie, of the federal live stock branch, Dr. J. G. Rutherford, of the C.P.R. department of Natural Resources, Wm. E. Scott, Deputy Minister of Agriculture, F.

B. Ward, Douglas Lake, G. H. Hadwen, P. H. Moore, Experimental Farm, Agassiz and Alex. Davie.

A. D. Paterson, of Delta was re-elected president. Directors; Geo. Sangster, Alex. Davie, H. Webb, Lower mainland; Capt. Jas. Erskine, G. R. Hughes, F. J. Bishop, Islands; J. B. Tiffin, F. B. Ward, J. R. Jackson, M.L.A., upper country; W. T. McDonald, secretary-treasurer.

THE BRITISH COLUMBIA BEE-KEEPERS' ASSOCIATION

The first meeting of the newly incorporated Bee-keepers' Association of British Columbia was held at Vancouver on April 5th. The questions of making an exhibit at the Vancouver Exhibition; the standardization of hives; the using of a standard label, and summer demonstration meetings were under discussion. Addresses were delivered by various members of the association on the following subjects: "Spring management and swarm control on the Lower Mainland of B.C.;" "Honey exhibits at the fair;" "The work of the queen;" "The Hive;" and "Suggestions to beginners." The officers of the association

are: Hon. president, W. E. Scott, Deputy Minister of Agriculture, Victoria; hon. vice-presidents, E. S. Knowlton, Vancouver, John Reagh, Ladner; Rev. Thomas Menzies, Sandwick, V.I.; president, D. Mowat, McKay, B.C.; vice-president, W. H. Turnbull, Sullivan, B.C.; hon. secretary treasurer, William Hughes, Victoria; directors, John Brooks, Fred E. White, Wilfred M. Smith, George Coe, H. L. Chittenden, A. Smith, H. L. Johnson, J. W. Winson, A. W. Findlay, W. Till-Tout, C. Sprott, J. P. W. Rant, W. H. Lewis, W. G. Mills, George Dennis, George Parks, A. P. Glen, Mrs. C. A. Troughton and J. Robinson.

NEW PUBLICATIONS

THE DOMINION DEPARTMENT OF AGRICULTURE

THE DOMINION EXPERIMENTAL FARMS

Annual Report, Year ending March 31st, 1915, Vol. II. The first volume of the twenty-eighth annual report of the Experimental Farms of Canada, noticed in the February number of THE AGRICULTURAL GAZETTE, page 194, comprised 574 pages and was devoted to the report of the year's operations of the Director and of the division of chemistry, animal husbandry, and field husbandry. The second volume, which was issued early in March, comprises 655 pages and includes reports from the divisions of horticulture, cereals, botany, bees, forage plants, poultry and tobacco. In each case the work that has been carried on is detailed with interesting and valuable exactness, accompanied in instances by full-page and half-page photographic illustrations. The completeness of the different reports is possibly best indicated by stating that horticulture takes 280 pages, cereals 84 pages, botany 43, bees 23, forage plants 85, poultry 52 and tobacco 57. All the branch farms and stations

have sent their quota. Not only have almost innumerable experiments and tests been undertaken, but publications have been written and circulated widely, and a vast deal of correspondence carried on, as will be appreciated when it is said that the Division of Horticulture alone received 7,586 letters and despatched 7,979, an increase of over a thousand compared with the previous year. It should perhaps be mentioned that all the branches and divisions are prepared to answer any reasonable questions put to them and that such communications are invited.

THE PUBLICATIONS BRANCH

The School Garden as Regarded and Carried on in the Different Provinces, constitutes Pamphlet No. 4 of The Publications Branch of the Dominion Department of Agriculture. This pamphlet is a compilation of articles that have appeared in Volumes II and III of THE AGRICULTURAL GAZETTE, and is published for the benefit of teachers who direct school gardening work, or for those who contemplate beginning this work. The subject is dealt with under the following heads: The Model School Garden; Relationship of the School Gar-

den to the Class Room; Care of School Gardens during Summer Vacation; Why School Gardens Fail; The Propagation of Ornamental Plants Suitable for School Surroundings; The School Garden Municipality, and Gardening Operations. The whole comprises 64 pages replete with descriptive and instructive illustrations.

THE PROVINCIAL DEPARTMENTS OF AGRICULTURE NEW BRUNSWICK

Report on Agriculture for the Province of New Brunswick for the Year 1915. This report constitutes a 173-page book replete with information relative to the work of the various divisions of the Department. Numerous illustrations and charts enhance the value of the reading and statistical matter. It is worthy of note that the first page contains the "Roll of Honour" of the department, five of its officers having responded to the call of the Empire. The Hon. J. A. Murray, Minister of Agriculture, pays the following tribute to the financial assistance, to the extent of \$54,308.40, given by the Federal Department of Agriculture, through the provisions of THE AGRICULTURAL INSTRUCTION ACT: "Our educational work in this province has made decided progress, owing to the money placed at our disposal for this purpose, and the results attained to date are fully up to our expectations." The volume also includes the detailed reports of the Director of Elementary Agricultural Education, the Director of Agricultural Schools, the Field Husbandman, the Superintendent of Immigration, the Supervisor of Women's Institutes, the Entomologist, the Horticulturist, the Dairy Superintendents and the Poultry Superintendent. Much information is also given with regard to the campaign against the Brown Tail Moth, the Standing Field Crop Competitions, Seed Fairs and the Agricultural Societies of the province.

QUEBEC

Les Jardins Scolaires. This is a sixteen-page Bulletin giving explicit particulars, with illustrations and enumerative tables, of school garden and rural science instruction in the province of Quebec. In 1906, there were only 425 children being so taught, but in 1915, there were 18,020 at 710 schools. Pictures are also given of typical scenes at school fairs. Accompanying the Bulletin is an eight-page circular written by Jean-Charles Magnan, District Agriculturist, St. Casimir, Que., outlining the methods that are followed, and that will be followed month by month.

ONTARIO

Report of the Ontario Bee-keepers' Association, 1914. A mass of useful information is to be obtained from the thirty-fifth annual report of the Bee-keepers' Association of the province of Ontario. It makes a blue book of 78 pages, and besides the numerous addresses by experts and qualified officials on appropriate subjects and discussions thereupon that it contains, the question drawer is especially valuable and interesting. Morley Pettit, Provincial Apiarist, supplies a full and statistical report on apiary inspection and demonstration.

Spring Hints on Farming in New Ontario by P. Stewart, B.S.A., District Representative of the Ontario Department of Agriculture in Kenora. This is a 12-page pamphlet containing hints on every phase of New Ontario farming prepared by the author as material assistance "to settlers of Kenora District, having faith in themselves and their land, who want to try and work in harmony with surroundings, so that they may thereby be better citizens, and get the most out of life." The field covered is indeed wide and is sub-divided under the following heads: Farm power for beginners; soil and cultivation; grain growing; clover growing; potato growing; side lines, including poultry, sheep, goats, gardening, etc. Under the head of grain growing full directions are given relative to the choice of proper varieties for the district, preparation and cleaning of the grain for seed and treatment of grain for the prevention of smut. To the settler in the Kenora district this pamphlet is timely and contains much valuable information.

MANITOBA

The Report of the Thirteenth Annual Convention of the Manitoba Grain Growers' Association, held at Brandon, Man., January 5, 6 and 7, 1916, makes a forty-eight page pamphlet that will be found of interest not only within the boundaries of the province but by many people outside. The full text of the different addresses delivered is given.

Boys' and Girls' Clubs, by S. T. Newton, Superintendent of Extension Service, Manitoba Agricultural College. This is a companion book to "Woodworking Problems", noticed in the March number of THE AGRICULTURAL GAZETTE. Besides being a complete manual on the formation of boys' and girls' clubs, instructions are given in practical farm woodworking, fodder corn growing, pig raising, potato growing, poultry raising, bread-baking, canning and preserving, sewing and other occupations. Prize lists and rules are

suggested for school fairs and the methods outlined of conducting competitions and contests of pretty well every suitable description. A commendatory article on the boy scout movement is included. Many illustrations of an appropriate character adorn the pages of the book, which can be had for 25 cents.

Marketing Manitoba's Wool Crop is the title of Circular No. 33 of the Manitoba Department of Agriculture. This circular at once announces that the Department of Agriculture is prepared to handle the wool clip of the province on a co-operative basis, outlines the plan to be followed, and gives concise and complete directions "re" how "to market a good class of wool", under the following seven heads: Before shearing, catching, shearing, rolling the fleece, tying, sacking, and shipping. The Department, as announced in the circular, will act as agents for the farmers, will, up to July 1st, 1916, receive the wool delivered in Winnipeg, where it will be weighed, sorted and graded under the supervision of expert wool graders sent out by the Federal Department of Agriculture. The wool will then be sold on grade for the highest obtainable price. On receipt of wool, the Department will make an advance up to two-thirds of the local market price, the balance, less a sufficient sum to cover actual expenses, to be paid as soon as final settlement is received.

Increase your Profits by Sowing Better Seed is the striking heading which appears in bold type at the top of an illustrated poster, approximately 14 by 28 inches in size, issued by the Manitoba Department of Agriculture. The object of the poster is to encourage farmers to take every precaution necessary for the production of good crops during 1916, and deals lucidly with the weed situation and offers suggestions for the control of weeds. The value of the fanning mill is shown and proven by the results of an experiment conducted at the Manitoba Agricultural College last year in which uncleaned seed gave a yield of 36 bushels and 40 pounds wheat per acre, seed cleaned once gave a yield of 38 bushels and 40 pounds, while seed cleaned three times gave a yield of 39 bushels and 20 pounds. The use of registered seed is also encouraged and the advantages demonstrated by the results of an experiment conducted last year by the Canadian Seed Growers' Association, in which common seed gave a yield of 37.8 bushels per acre and registered seed 51.4 bushels. To assist in preventing the annual loss from smut in grain, farmers are recommended to treat their seed with either the formalin or bluestone methods, directions for each of which are given.

Report on Crop, Live Stock, Etc., is Bulletin No. 92 of the Manitoba Department of Agriculture and Immigration. The reports as contained in this bulletin are summarized from returns received from 950 regular correspondents of the Department, resident in every district in the province. Statistical tables give full and complete information with regard to the average yield of crops, potatoes and roots, fodder crops, and tabular statements are included with reference to dairy products, live stock, poultry disposed of by farmers, and land prepared for crop.

The table headed "Grain Crops" on page eight, shows the comparative acreage, total grain yield and yield per acre of wheat, oats and barley for a period of ten years. Wheat shows an average yield for the whole province of 26.4 bushels, as compared with 15.5 bushels in 1914, and as against 17.6 bushels of an average for the ten years previous. Oats averaged 47.7 bushels, against 30 bushels in 1914, and an average of 38.6 for the ten years previous. Barley averaged 34 bushels, against 20 bushels in 1914, and an average of 28 bushels for the ten years previous. Potatoes show an average yield of 114.8 bushels per acre for 1915, as compared with an average yield of 140.4 bushels in 1914. Owing to late spring frosts in June and early autumn frosts in August, the corn crop was a partial failure; 52,713 acres were planted in 1915, and 30,430 acres in 1914. There were increases upon 1914 of over a million pounds in the make of creamery butter, over 260,000 pounds in that of dairy butter and over 25,000 pounds in the output of cheese, while the increase in the total value of milk and milk products was over \$427,000. Lists of creameries and of cheese factories in Manitoba show that there were 36 and 22 respectively, in active operation during 1915. Concluding tables show the acreage, average yields and total yields of wheat, oats, barley and flax for the last ten years.

SASKATCHEWAN

Seed Grain, Seed Treatment and Seeding and The Tillage of Stubble Land are two circulars by John Bracken, Professor of Field Husbandry, University of Saskatchewan, that afford ample information on the subjects of which they treat.

A series of leaflets issued by the provincial Department of Agriculture remind farmers of the duty that is theirs, to destroy gophers, that cost them \$4,000,000 last year; to make application to the Bureau of Labour at Regina if they are in want of help and to enroll stallions standing for service before May 1st. The terms on which pure-bred live stock are distributed are given and farmers are counselled to take precautions by inoculation against the spread of blackleg.

The Sheaf is a diversified monthly publication of some forty pages issued under the direction of the Students' Representative Council of the University of Saskatchewan, the number of which for March has reached THE AGRICULTURAL GAZETTE office.

BRITISH COLUMBIA

Field Crop Competitions, Bulletin No. 69, prepared by H. O. English, Soil and Crop Instructor, is the announcement of the field crop competitions and seed fairs for 1916, and the awards in these competitions for 1915. Field crop competitions are, in British Columbia as in other provinces, serving a useful purpose and the increased interest being taken in them by British Columbia farmers is shown by the following table:

YEAR	Number of Institutes Competing	Number of Competitions	Number of Competitors
1912	14	20	
1913	21	31	305
1914	49	80	587
1915	59	101	812

The first number of *The Agricultural Journal*, a publication that is to be issued monthly by the Department of Agriculture at Victoria, B.C., has come to hand. It consists of eight pages, 8½ inches by 11½ inches, and is designed to keep the farmer posted on the requirements of the time. The initiatory number devotes the cover page to a picture of a large and impressive-looking silo, beneath which we are informed that many British Columbia farmers are building silos according to specifications drawn up by Department officials. On the second inside page is an article by Mr. W. E. Scott, Deputy Minister of Agriculture of the province, explaining the objects of *The Journal*, advising farmers of the way in which they can do their "bit" in these stressful times, and calling upon them to unite for the common good. The value of silage is dealt with and a page is given up to boys and girls and to the contests and competitions in which they are invited to take part. Tribute is paid to the late Thomas Cunningham, who for nearly twenty years rendered faithful service as provincial Inspector of Fruit Pests. The seventh page refers to the increased duty on apples and to the importance of spraying and the energetic removal of cankers. The subscription price is 25 cents a year.

NOTES

P. Stewart, B.S.A., District Representative of the Ontario Department of Agriculture in the Kenora District, recommends the following varieties of grains for his district: Oats—Orloff; O.A.C. No. 3 and Daubeney; Barley—O.A.C., No. 21; Wheat, Marquis; Peas, Early Briton.

More than \$112,000,000 worth of horses and \$23,000,000 worth of mules were exported from the United States in the sixteen months ending January 1, 1916. This represents a greater total of cash received for horses and mules than was received for the whole of the preceding 16 years.

The registration fee on imported Percherons has been raised by the Percheron Society of America to \$100. Of this amount \$85 will be returned to owners of imported horses that are prize-winners at fairs. The idea is to put a check on the importation of inferior horses. Provision has also been made by the society to recognize with a special classification Canadian fairs that are recognized by the Canadian Percheron Association.

Mr. Morley Pettit, Provincial Apiarist for Ontario states that in 1915 co-operative experimental material was sent to 421 persons in the province keeping 14,808 colonies of bees, an average of 35 colonies each.

The staff of the Nova Scotia Department of Agriculture has been considerably reduced through the enlisting of officers for Overseas' Service. The following have gone forward:

B. H. Landels, Superintendent of Drainage; A. E. Humphrey, Assistant to Superintendent of Drainage; W. C. Good, Assistant Provincial Entomologist; W. J. Bird, Assistant Dairy Superintendent.

During 1915 it is reported that potatoes were grown on 3,897 farms in the Northern and Western states from seed treated for scab at the suggestion of county agents (district representatives). On 1,261 farms hill-selected seed was used in planting; on 3,785 farms the suggestions of county agents were followed in growing potatoes with a resultant average increase in yield, so far as yields were determined, of 45 bushels per acre.

Dr. G. C. Creelman, President of the Ontario Agricultural College, Guelph, announces changes in the Physics Department of the College as follows: The Farm Drainage Campaign, inaugurated by the Ontario Agricultural College in 1905, has developed such proportions that it has become necessary to divide the work of the Department of Physics. Professor W. H. Day, as head of the Department, will continue in that capacity, and, besides teaching, will conduct experiments in evaporation, cold storage, farm power, farm water supply, ventilation, etc. The drainage work has been assigned to J. R. Spry, B.S.A., who has been associated with Prof. Day in the drainage work almost from the beginning.

Director J. E. Howitt, M.S.A., of the Co-operative Experiments in Weed Eradication, conducted by the Ontario Agricultural and Experimental Union, has announced the following series of experiments for 1916: (1) The use of rape in the destruction of Perennial Sow Thistle; (2) A system of intensive cropping and cultivation, using winter rye followed by turnips, rape or buckwheat, for eradicating Perennial Sow Thistle; (3) The use of rape in the destruction of Twitch Grass; (4) A method of cultivation for the destruction of Twitch Grass; (5) Method of cultivation for the eradication of Bladder Campion or Cow Bell; (6) Spraying with Iron Sulphate to destroy Mustard in cereal crops; (7) A method of cultivation for the destruction of Oxeye Daisy.

A scheme for the employment of women on farms has been adopted in many counties of England which is producing satisfactory results. Women's county committees, working either in co-operation with, or as sub-committees of, the War Agricultural Committees, had been established in twenty-five counties at the end of January; in the other counties it was announced that similar committees of women would shortly be formed. A scheme of systematic propaganda work is being carried on in all parts of the country by means of local meetings, followed by house to house canvass. Village registers are being established, and women urged on patriotic grounds to enrol for farm work for whole or part time. In order to press forward with this work, the Board of Agriculture has formed a panel of speakers who are available to address meetings, and additional women organizers have been appointed by the Board of Trade and allocated to various parts of the country. A number have also made a visit to France to become posted on methods adopted there.

In an address delivered before the members of the New Brunswick Potato Growers' Association, Prof. G. C. Cunningham, Plant Pathologist, stated that "basing his information on a survey made in 1915 by himself and his assistants of the potato fields in many sections of the province, the total losses due to disease, of the possible total crop, were as follows: Black-leg, 7 per cent loss or 480,000 bushels; Rhizoctonia, 5 per cent loss or 600,000 bushels; Mosaic disease, 10 per cent loss or 1,200,000 bushels; Late Blight, 25 per cent loss or 3,000,000 bushels, a total of 47 per cent loss, or over 5,000,000 bushels."

The Vacant Lots' Garden Club of Edmonton, Alberta, recently held an organization meeting attended by representatives of the Local Council of Women, the Women's Civic Club, the Daughters of the Empire, the Highland Ladies' Improvement Club, the Consumers' League, Board of Trade, Board of Agriculture, Public School Board, Welfare League, High School Teachers' Association and the Public School Teachers' Association. The officers elected for the year were: Chairman, Geo. Harcourt, vice-chairman, Mrs. Bishop, secretary, pro-tem, Superintendent Carpenter of the Public School Board. The outlook for the summer is very promising and a committee of three was appointed to estimate the number of available vacant lots within the city.

According to figures recently compiled by the Bureau of Foreign and Domestic Commerce at Washington, the United States shipped 678,443 horses and mules, worth \$131,914,000 to Europe for the Allied armies during the past year and a half.

During the whole of 1913 only a few more than 30,000 horses and mules went to Europe from the United States, but three months after hostilities began they were going at the rate of 30,000 a month. The steady flow reached its height last October, when 56,000 were shipped.

Despite a diminished supply the price of horses has dropped considerably within the last few months. The average price on January 1, 1916, was \$101.60, compared with \$103.15 a year ago, and \$109.14 in 1914. The average price of animals supplied to the allies was upwards of \$200. Ordinarily the rate of increase in horses and mules is about one per cent a year, but last year the European demand caused the supply to diminish by about 35,000 animals. The Department of Agriculture on January 1 estimated the number of farm animals in the United States at 25,000,000. A census bureau estimate puts the number in cities at 3,500,000.

W. A. Clemons, Secretary, Canadian Holstein-Friesian Association, reports that a new Canadian seven-day record for mature Holstein-Friesian cows has been established. Belle Model Johanna 2nd, seven-year-old cow owned by A. C. Hardy, Brockville, Ont., gave 29.87 pounds of fat equal to 37.34 pounds of butter. This record was made early in March.

Commissioner J. G. Whitson, in his report on the year's work in Northern Ontario, states that 597 miles of new roads have been laid in that country. In addition to this nearly 300 miles of grading and surfacing was done on new and old roads, and 113 miles of old roads were partly graded or improved. A dam was also built across the Frederick House River, which was 450 feet in length.

The American National Live Stock Association at its nineteenth annual meeting passed a resolution strongly indorsing the principal and purposes of the Smith Lever Bill passed by Congress providing certain sums of money to be used for agricultural education in the different states of the union that agree to appropriate a sum of money similar to that given by the United States Government. At the same meeting the Association endorsed the work of Agricultural Colleges, and urged a campaign of education to the end that every voter in the country may support the Legislature of his State in any action appropriating money for Agricultural Colleges.

The Public Health Committee of the Ottawa Council of Women have publicly recommended the utilization of vacant property for the raising of garden produce. This organization assisted in this movement last year by distributing pamphlets on the cultivation of vegetables and in providing seeds to charitable organizations in the city. They also offered prizes in money for back-yard gardening competitions. The Committee commend the action of the congregation of St. Andrew's church in making available to poor people for gardening purposes, a large piece of land owned by them. Other churches are recommended to form committees and carry on this kind of work on un-occupied real estate in the vicinity of the city. They conclude their appeal with the following:

"If a number of people would give this project their serious consideration and assistance, it would probably have the effect of raising a large army of producers by next summer who would, by this means help reduce the cost of living and help make the country more productive."

In the province of Saskatchewan power has been given to the school boards throughout the province to provide a dwelling for the teacher. Subsection 8 of section 110 of The School Act of the province provides

"It shall be the duty of the board of every district and it shall have power . . . if deemed advisable to purchase or rent sites or premises for a house for the teacher and to build, repair and keep in order such house."

In a few cases school boards have provided suitable dwellings for teachers.

The Farm Demonstration Monthly for March, issued at Washington, referring to the work of county agents states that 171 of them reported 14,036 farmers testing seed corn for germination and 352,546 acres were planted with tested seed. Many farmers test their own seed at practically no expense. The value of planting tested seed corn varies, but numerous reports show that seed of a high percentage of germination is one of the most important factors in good yields. One Ohio agent makes the following statement:—

"Corn taken from a crib from which seed corn was sold, but which had no special care to dry it before freezing weather, gave only 73 percent of a stand and a yield of 292 pounds, as compared with 419 pounds from a full stand in rows of the same length planted with tested seed."

The Ontario Agricultural and Experimental Union, through Mr. Morley Pettit, Provincial Apiarist, Ontario Agricultural College, Guelph, has announced twelve co-operative experiments with bees for 1916. These include: Prevention of natural swarming in extracted honey production by holding the colony together; prevention of natural swarming in comb honey production by artificial shaken swarming; prevention of natural swarming by manipulation of hives instead of combs; method of spring management to get strong colonies for the honey flow; the "fasting" and "smoke" methods of introducing a laying queen to full colonies; wire cloth bee escape board for removing bees from supers; use of new wire embedder, and a method of wiring frames so that a full sheet of foundation is held securely without the trouble of fastening it to the top bar. In addition to this announcement a special patriotic appeal is made to all bee-keepers, in view of the food and monetary value of the honey produced each year, to make special efforts to care for the bees now in the province, and, where possible, to increase the number of colonies kept.

The prize lists are out for the third annual flower and vegetable show to be held in the main building of the Nova Scotia Agricultural College at Truro, on September 5th, next, under the auspices of the Local Council of Women. Exhibitors must reside in Colchester County, N.S., and be under 16 years of age. Practical interest is manifested in the show and the work of the boys and girls by the donation of a number of prizes by business men for special features. The prize list, of which 2,500 copies are circulated, contains a page announcement of The Rural Training School which meets in Truro every July and August, to give teachers specific instruction in the art of gardening. Application for information regarding the school has to be made to the Director of Rural Science, Truro, N.S.

With the coming into force of THE AGRICULTURAL INSTRUCTION ACT, Prince Edward Island was enabled to add several trained men to its staff of educators. The Department of Agriculture has also been encouraged to pursue an aggressive policy of agricultural instruction. Short courses have been conducted at various points in the province. Referring to these and other activities the editor of *The Charlottetown Guardian* has the following to say:

"There is now no doubt that the new departure in the holding of short courses in agriculture at different centres throughout the province instead of at one centre as formerly is going to prove a great success. The series of classes held in Prince county, and the keen interest taken in them by the farmers, coupled already with a request for their continuance yearly, is the strongest possible evidence that the new method is not only the popular, but the practical, way of bringing the agricultural colleges and the experimental farms within reach of all.

"The Department of Agriculture is conducting an educational campaign throughout the province which, if taken hold of generally, as it is in some localities, cannot fail to greatly increase the annual revenue from the farms and make the province in fact as well as in name the garden of Canada. There is much yet to be done, much yet to be learned, before our million and a quarter acres yield the revenue they should yield. A little extra effort on the part of each farmer, a little more applica-

tion of the methods approved by our experimental farms and agricultural colleges, and a little more of the co-operative spirit among our farmers, will in a few years revolutionize our farm methods and ought to more than double the value of our crops. To effect this is the object of the present educational campaign which is being carried right to the farmers' doors."

According to Mr. H. Warner Allen, Representative of the British Press with the French army, the agricultural outlook in France for 1916 is distinctly favourable, and there is every hope that this year's harvest will show a marked increase on that of last year. On January 1st, 1916, the following are as of land were under cultivation:

Wheat	12,586,285 acres
Mixed crops (wheat & rye)	239,695 "
Rye	232,437 "
Barley	249,425 "
Oats	1,712,450 "

The following statistics represent the number of cattle, farm animals, etc., in France:

Horses	2,156,429
Mules	143,561
Donkeys	324,250
Cattle	12,514,414
Sheep	13,379,124
Pigs	4,915,780

It will be found that, while wheat is not being as widely sown this year as last, the acreage in flax and barley will be increased, and the area in oats will be about the same as a year ago. The unprecedented prices for hogs are inducing many farmers to raise pork again, as they did in 1913, following the opening of the United States market. The live stock industry in all its departments is quite promising at the present time in Western Canada. There is any amount of feed for live stock lying about the West waiting for a demand of some sort, and the prospect for an abundant hay crop in the Alberta foothills was never brighter. In conclusion, the favourable circumstances affecting the live stock business bid fair to equalize almost any loss that may accrue to the country through the smaller area of wheat.—*Norman Lambert, in Toronto Globe, April 23th, 1916.*

INDEX TO PERIODICAL LITERATURE

- The Present Trend of Nature-Study in Wisconsin,
Fred T. Ullrich, *Nature Study Review*, Ithaca, N.Y., March, 1916, page 102.
- The Advantages of Household Science to the Country Girl,
Miss M. M. Goldie, Teacher of Domestic Science at the Provincial Agricultural School at Olds, Alta., *The Saskatchewan Farmer*, Moose Jaw, Sask., March, 1916, page 4.
- The Tractor and the Horse,
Prof. Jacobs, Manitoba Agricultural College, *The Canadian Thresherman and Farmer*, Winnipeg, March, 1916, page 6.
- Making the Rural School Beautiful,
Ich Dien, *The Canadian Countryman*, Toronto, March 4th, 1916.
- Experimental Orchard Work, Season '15,
Prof. W. Saxby Blair, *The Maritime Farmer*, Sussex, N.B., March 7th, 1916, page 341.
- Banks that Serve the Farmer,
Ex-Governor J. W. Leedy, State of Kansas, *The Grain Growers' Guide*, Winnipeg, March 8th, 1916, page 7.
- Advertising the Farm,
The Family Herald and Weekly Star, Montreal, March 8th, 1916, page 31.
- Home Economics in the Ungraded School,
Jean B. Peacock, *The Educational Review*, St. John, N.B., March 16th, 1916, page 210.
- The Feed to Grow and How to Grow It,
J. H. Grisdale, *The Farm and Dairy and Rural Home*, Peterboro, March 16th, 1916, page 3.
- Inheritance of Fertility in Swine,
Edward N. Wentworth, Professor of Animal Breeding, Kansas Agricultural Experiment Station, *Journal of Agricultural Research*, Washington, D.C., March 20th, 1916, page 145.
- Prince Edward Island's Quality Reputation,
The Maritime Farmer, Sussex, N.B., March 21st, 1916, page 377.
- The Grain Growers' Guide*, Winnipeg, March 22nd, 1916,
Canadianizing the Foreign Born, S. E. Greenway, Director Extension Work, University of Saskatchewan, page 7.
Boy and Girl Farmers, A. W. Cocks, Director of School Agriculture, Province of Saskatchewan, page 8.
- Manitoba's Legislative Programme,
The Grain Growers' Guide, Winnipeg, March 29th, 1916, page 7.
- Feeding the Dairy Cow—Maximum Profits,
F. R. Mallory, *Farm and Dairy and Rural Home*, Peterboro, March 23rd, 1916, page 275.
- Farm Cost Accounting Made Easy,
M. C. Burritt, State Director of Farm Bureaux of New York, *Power Farming*, St. Joseph, Mich., April, 1916, page 30.
- The Farmer's Magazine*, Toronto, April, 1916.
Our Greatest Hired Man, John J. Lyons, page 9.
Growing Farmers in Saskatchewan—How the Boys, Girls and Farmers in General are being helped to Work out Their Daily Tasks on the Farms of the Province, page 17.
Light Tractors and the Labour Problem, by R. M. Gordon, page 19.
Boys' and Girls' Gardens, by Alex. MacPherson, page 38.
- The Alfalfa Crop,
James Murray, Macdonald College, *The Journal of Agriculture*, Montreal, April 1st, 1916, page 216.
- The Light Tractor for Small Eastern Farmers,
R. Gordon Moffatt, *The Canadian Countryman*, Toronto, April 1st, 1916, page 431.
- Forward to the Land,
The Saturday Press and Prairie Farm, Saskatoon, Sask., April 1st, 1916, page 4.
- The Maritime Farmer*, Sussex, N.B., April 4th, 1916,
Lack of Potash in Commercial Fertilizers, by Leslie Emslie, C.D.A., F.C.S., Supervisor Investigational Work with Fertilizers, Ottawa Experimental Farm, page 413.
New Brunswick Potato Growers' Convention, page 415.
- The Nor'-West Farmer*, Winnipeg, April 5th, 1916,
Crop Production on Stubble Land in 1916, by J. H. Grisdale, Director, Dominion Experimental Farms, page 373.
The Noxious Weeds Problem, by Hon. W. R. Motherwell, page 378.
- Ways and Means of Marketing Wool that Might be Applied in Ontario, *The Farmer's Advocate*, London, April 6th, 1916, page 609.
- Agricultural Devastation in France and Allied Countries,
Ernest H. Godfrey, F.S.S., *The Journal of Commerce*, Montreal, April 11th, 1916, page 5.

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DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE

The Agricultural Gazette of Canada

EDITOR · J. B. SPENCER, B.S.A.

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CONTENTS

	PAGE
Rural Highways.....	493
Production and Thrift.....	494

PART I.

THE DOMINION DEPARTMENT OF AGRICULTURE

Federal Appropriations for Agriculture.....	501
The Dominion Experimental Farms:—	
The Division of Horticulture—	
Horticulture at the Dominion Experimental Station, Morden, Man., by W. T. Macoun.....	502
The Tobacco Division:—	
Changes in Staff.....	504
The Entomological Branch:—	
Some Stem Maggots Attacking Growing Grain, by Norman Criddle.....	504
The Dairy and Cold Storage Branch:—	
Special Refrigerator Car Services.....	508
Inspection of Dairy Products, by J. F. Singleton.....	510
Grading Creamery Butter in the Prairie Provinces, by Geo. H. Barr.....	511
The Live Stock Branch:—	
Wool Exhibit, by T. Reg. Arkell.....	512
The Record of Performance.....	513
The Health of Animals Branch:—	
Orders respecting Foot and Mouth Disease, Imports of Animals, etc.....	515
The Fruit Branch:—	
Apple Production in Ontario in 1915, by F. H. Grindley.....	516
Inspection Statistics.....	517

PART II.

THE PROVINCIAL DEPARTMENTS OF AGRICULTURE

Agriculture in Canada:—	
Quebec, by H. Nagant.....	518
Rural Highways:—	
Prince Edward Island, by L. B. McMillan.....	525
Nova Scotia, by W. G. Yorston.....	526
New Brunswick, by John L. Feeney.....	529
Quebec, by B. Michaud.....	530
Ontario, by W. A. McLean.....	533
Manitoba, by A. McGillivray.....	538
Saskatchewan, by H. S. Carpenter.....	540
Alberta and British Columbia.....	542
Road Drag Competitions:—	
Manitoba.....	542
Saskatchewan, by H. S. Carpenter.....	544
Grants to Live Stock and Poultry Organizations:—	
Prince Edward Island, by Theodore Ross.....	546
Nova Scotia, by M. Cumming.....	546
New Brunswick, by J. B. Daggett.....	547
Quebec, by J. Antonio Grenier.....	548
Ontario, by W. Bert Roadhouse.....	548
Manitoba.....	549
Saskatchewan, by F. H. Auld.....	549
Alberta, by James McCaig.....	550

Agricultural Legislation:—	PAGE
Prince Edward Island	551
Nova Scotia	551
Ontario	552
Manitoba, by George Batho	554
Saskatchewan	557
Alberta, by James McCaig	558
Notes from District Representatives:—	
Quebec	560
Ontario	561
Quebec:—	
Bacon Hog Contest	563
Dairy Inspectors in Convention, by M. A. Dion	563
Ontario:—	
Children's Potato War Plot Fund	564
Spring Report on Bee-Keeping	565
Manitoba:—	
Notes	566
Alberta:—	
Better Farming Train, by H. A. Craig	568

PART III.

RURAL SCIENCE

Summer Schools for Teachers:—	
Prince Edward Island	569
Nova Scotia, by L. A. De Wolfe	569
New Brunswick, by R. P. Steeves	569
Ontario, by J. B. Dandeno	570
Manitoba	571
Saskatchewan	571
Alberta	571
Prince Edward Island:—	
The Household Science Short Courses, by Miss Hazel Sterns	572

PART IV.

SPECIAL CONTRIBUTIONS, REPORTS OF AGRICULTURAL ORGANIZATIONS, NOTES AND PUBLICATIONS

The Preservation of Bird Life	573
Vacant Lot Gardens in Ottawa	574
Societies and Associations	575
New Publications	577
Notes	583
Index to Periodical Literature	584

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RURAL HIGHWAYS

NO peaceful movement has made more rapid strides in Canada than the improvement of rural highways. Whereas, up to a dozen years ago, a comparatively insignificant amount was expended on country roads, other than the main or trunk roads, there has in recent years been spent in construction and maintenance about fifty millions of dollars. While the farm had plenty of help, slow travel and small loads did not matter, but when every hour and every dollar must be conserved to meet the requirements of the times, a smooth, hard road at all seasons of the year is demanded by the rural dweller as by the urban citizen accustomed to motor travel. The motor influence has been characterized the nurse, if not the parent, of the good roads movement.

Nor is the extensive use of the automobile confined to the city man. The driving horse and covered buggy and the market conveyance on the farm are being substituted by the motor car and truck, with the result that not only good but best roads are demanded alike by all classes of the community and in every province in Canada. But it is to the farmer that the matter of the roadway is pre-eminently important. To him it means independence of the railways in some measure, early arrival at the market, ability to transport his produce at all seasons, and freedom from vehicular trouble. With improved roads he will be able to cover twice the distance with half the effort he now exercises. They will also, by affording better facilities for reaching schools, be a practical aid to education.

Following the lead of individual good roads crusaders, associations have been formed in every province. These have merited and secured government recognition and have greatly assisted the respective governments in formulating and carrying out the policies that are now working a revolution in rural highways. And since each province has worked out its own organization according to local needs, each is dealing with the matter in its own way. In order that these several policies may be compared, a responsible official in each of several provinces deals with the subject in this number of THE AGRICULTURAL GAZETTE.

PRODUCTION AND THRIFT

METHODS OF PUBLICITY EMPLOYED IN THE CAMPAIGN

JUST as the Patriotism and Production campaign, inaugurated and carried on by the Department of Agriculture of Canada in 1915, brought in its wake magnificent results, so there is every reason to hope and expect the Production and Thrift movement instituted this year will have a like effect. A great deal of strenuous work has been done. A series of five large display advertisements, eight inches by six, each making a separate appeal, and copies of which appear in succeeding pages of this number of THE AGRICULTURAL GAZETTE, were published in the newspapers and periodicals of the country. Some thirty or forty different articles directing attention to the advertisements and emphasizing the objects of the campaign were sent out. The newspapers, practically without exception, generously seconded the efforts that were made. Clergymen in the pulpit took the matter up, and teachers in the class room founded lessons and lectures thereupon. Women's Institutes and home economic societies warmly espoused the cause. In fact every class of the community appeared to feel that Production and Thrift embodied something in which all were vitally interested.

It will be noticed that the first, second and fourth advertisements appeal most to the agriculturist. In the first, it is pointed out that the Empire's demands for food are greater this year than last, and, therefore, a continuation of the splendid effort in production that was made last year is asked for. In the second advertisement an appeal direct is made to farmers, dairymen, fruit-growers and gardeners to main-

tain and increase all varieties of foodstuffs. Those classes of the community are reminded that the need is greater in 1916 than it was in 1915; that the difficulties are more; that the task is heavier, the call to patriotism is louder and, consequently, production and thriftiness are required to the limit. In the fourth advertisement attention is mainly directed to the necessity that exists for improvement in live stock breeding and to the markets that are open now, and that will be available after the war, for all descriptions of meat, dairy products, eggs and poultry.

The third and fifth advertisements are of a more general character than the others. The third appeals to everybody—to the workman as well as to the capitalist, to the tradesman as well as to the professional man, to the woman as well as to the man, to the girl as well as to the boy—to labour efficiently, to be saving and to spend money wisely. The fifth is headed "Canada's call for service at Home." It repeats the advice of the third, but seeks to give it greater intimacy and to point out the necessity not only for the utmost production, but also for economy in everything, in the home as well as in the factory, on the farm as well as in the workshop; in fact, in all our industries as well as in our every day home life. "Every pound of food saved from waste is as good as a pound of increased production" is the statement made. It might, indeed, have been said, that it is better, because it indicates both production and thrift and also denotes character.

In one particular point this year's campaign differed from last year's.

In 1915, a series of meetings or conferences were held throughout the country that were addressed by experts in agriculture. This year such gatherings were confined to Quebec at places where they had been specially asked for. In each case the curés manifested a very active interest with the result that the attendance everywhere was most encouraging. In a general way the object was to encourage the greater production of live stock and agricultural products, through improved methods of breeding, feeding and farming. The Live Stock Department, under the immediate auspices of which the meetings were held, was represented at each by two specialists in the subjects they were to discuss. Previous to the opening of the campaign a conference was held at the Oka Agricultural Institute of the authorities who were to attend meetings in the French districts. At this conference the various subjects to be dealt with were discussed and the object sought to be attained explained by Dr. T. A. Brisson. Mr. J. A. McClary, Superintendent of the Experimental Farm at Lennoxville, Quebec, directed the organization in the Eastern Townships.

In all 112 meetings were held in March and April, distributed throughout the agricultural districts of the Province, with the exception of Wright, Pontiac, Temiskaming and Abitibi, the meetings in those Districts having to be postponed on account of the condition of the roads. Reports received indicate an average attendance of about 150.

THE AGRICULTURAL WAR BOOK as a factor in the "Production and Thrift" campaign was referred to at some length in the May number of this magazine. The principal features brought out in the review then published had reference particularly

to production. A section, however is devoted to the subject of thrift. After referring to the steps that are being taken in Great Britain and Germany to enforce economy and the husbanding of resources, the WAR BOOK says: "People are being taught that they must cut down their cost of living to its lowest point and restrict themselves to necessities. It does not matter whether individuals can afford superfluities or not. Every superfluity consumed means that so much labour has been expended in producing it which might have gone towards producing the necessities of life, or supplies for the army." It is also pointed out that thrift does not mean stinginess, cheeseparing, or hoarding, but does mean the judicious use of everything and the wise and safe investment of money.

A good deal of space is devoted in the book to economies in the home and to the ways in which they can best be practised. Especially is commended the purchase and consumption of Canadian products. The splendid part that woman is playing in connection with the war is dealt with and some well-considered counsel afforded relative to the avoidance of waste. Patriotic and relief work receives its quota of attention, so, too, do the place of education and the sphere of other activities of national value. As the book remarks: "The longer the war lasts, the more will farm products be needed." And it must never be forgotten that agriculture and education, likewise production and thrift, are not for this or next year only, but are for all time, and that as they receive attention so will the nation prosper.

On the five succeeding pages appear facsimiles of the advertisements that have been given the wide circulation spoken of at the beginning of this article:

Production and Thrift

GROWING CROPS ON STUBBLE LAND IN 1916

The Empire's Demands for food are greater this year than last. Less summer-fallow and less fall ploughing than usual in 1915 makes it necessary that the farmers of the Prairie provinces in 1916 shall sow extensively on stubble land

MR. J. H. GRISDALE, Director, and the Superintendents of the Dominion Experimental Farms, urge the following upon the Farmers:

STUBBLE LAND OF FIRST CROP AFTER FALLOW

Burn stubble thoroughly as soon as surface is dry. Fire about noon time when steady wind is blowing. Cultivate at once about two inches deep, then sow the wheat and harrow immediately afterwards. If possible, where area is large, harrow first, then cultivate, seed, and harrow again. In Eastern Saskatchewan sow $1\frac{1}{2}$ bush. per acre; in Western Saskatchewan $1\frac{1}{4}$ bush. On light soils and dry lands sow $\frac{1}{4}$ bush. less.

STUBBLE LAND OF SECOND CROP AFTER FALLOW

Usually this land should be summer-fallowed, but this year much of it must be in crop. Burn stubble if possible. This may be helped by scattering straw freely over the field. Wrap old sacking about the end of a 4-foot stick. Dip in gasoline. Set on fire and shake on straw and stubble. Carry gasoline in open pail. If stubble is too light to burn then cultivate, harrow and seed a little lighter than above. Oats and barley will do better than wheat. If shoe drills are used plough instead of cultivating. Plough, pack or roll, and then harrow, if land is grassy or weedy. In the drier sections at least one-third of all cropping land should be summer-fallowed every year.

STUBBLE LAND OF THIRD CROP AFTER FALLOW

Do not sow to grain, but summer-fallow. Better use your spring labour on other stubble land and thus make sure of crops in 1916 and 1917. Put your labour on land that is likely to give best returns.

SEED

Sow only clean, plump seed of tested variety. Use the fanning mill thoroughly and treat seed for smut. Have horses, harness and machines in good shape before starting work.

THE GOVERNMENT OF CANADA

THE DEPARTMENT OF AGRICULTURE

1
THE DEPARTMENT OF FINANCE

Production and Thrift

CANADA from her abundance can help supply the Empire's needs, and this must be a comforting thought for those upon whom the heavy burden of directing the Empire's affairs has been laid. Gain or no gain the course before the farmers of Canada is as clear as it was last year—they must produce abundantly in order to meet the demands that may be made, and I believe this to be especially true in regard to live stock, the world's supply of which must be particularly affected in this vast struggle. Stress and strain may yet be in store for us all before this tragic conflict is over, but not one of us doubts the issue, and Canadians will do their duty in the highest sense of that great word."—*HON. MARTIN BURELL, Minister of Agriculture.*

MODERN war is made by resources, by money, by foodstuffs, as well as by men and by munitions. While war is our first business, it is the imperative duty of every man in Canada to produce all that he can, to work doubly hard while our soldiers are in the trenches, in order that the resources of the country may not only be conserved, but increased, for the great struggle that lies before us. *'Work and Save'* is a good motto for War-time."—*SIR THOMAS WHITE, Minister of Finance.*

THE CALL OF EMPIRE COMES AGAIN IN 1916

TO CANADIAN FARMERS, DAIRYMEN, FRUIT GROWERS, GARDENERS

WHAT IS NEEDED? THESE IN PARTICULAR—

WHEAT, OATS, HAY,
BEEF, PORK, BACON,
CHEESE, EGGS, BUTTER, POULTRY,

CANNED FRUITS, FRUIT JAMS,
SUGAR, HONEY, WOOL, FLAX FIBRE,
BEANS, PEAS, DRIED VEGETABLES

We must feed ourselves, feed our soldiers, and help feed the Allies. The need is greater in 1916 than it was in 1915. The difficulties are greater, the task is heavier, the need is more urgent, the call to patriotism is louder—therefore be thrifty and produce to the limit.

"THE AGRICULTURAL WAR BOOK FOR 1916" is now in the press. To be had from The Publications Branch, Department of Agriculture, Ottawa.

THE GOVERNMENT OF CANADA

2

THE DEPARTMENT OF AGRICULTURE

THE DEPARTMENT OF FINANCE

Production and Thrift

TO win the war with the decisiveness which will ensure lasting peace, the Empire will require to put forth its full collective power in men and in money. From this viewpoint it is our true policy to augment our financial strength by multiplying our productive exertions and by exercising rigid economy, which reduces to the minimum all expenditures upon luxuries and non-essentials. Only in this way shall we be able to make good the loss caused by the withdrawal of so many of our workers from industrial activities, repair the wastage of the war, and find the funds for its continuance. It cannot be too frequently or too earnestly impressed upon our people that the heaviest burdens of the conflict still lie before us, and that industry and thrift are, for those who remain at home, supreme patriotic duties upon whose faithful fulfilment our success, and consequently our national safety, may ultimately depend."—SIR THOMAS WHITE, *Minister of Finance*.

**PRODUCE MORE, SAVE MORE.
MAKE LABOUR EFFICIENT.
SAVE MATERIALS FROM WASTE.
SPEND MONEY WISELY.**

LET US PRODUCE AND SAVE—

The war is now turning on a contest of all forces and resources—men, munitions, food, money. The call to all is to produce more and more. It may be necessary to work harder. The place of those who enlist must be taken by those at home, men and women, old and young. The more we produce the more we can save. Produce more on the farms and in the gardens. Save more and help to win the war.

LET US NOT WASTE OUR LABOUR—

In this war-time all labour should be directly productive or should be assisting in production. Make it as efficient as possible. If your labour is on something that can be postponed, put it off till after the war and make your labour tell now. Making war is the first business of all Canadians. Efficiency in labour is as important as efficiency in fighting.

LET US NOT WASTE MATERIALS—

Begin at home. The larger portion of salaries and wages is spent on the home—food, fuel, light, clothing. Are any of these things being wasted? \$20.00 a year saved from waste in every home in Canada will more than pay the interest on a war debt of \$500,000,000.

LET US SPEND OUR MONEY WISELY—

Are you spending your money to the best advantage? What do you think of extravagance in war time? Tens of thousands of Canadians are daily risking their lives for us at home. Is it not our duty to be careful and economical? Canadian dollars are an important part of the war equipment. Make them tell. Have a War Savings Account. Buy a War Bond.

THE GOVERNMENT OF CANADA

3

THE DEPARTMENT OF AGRICULTURE

THE DEPARTMENT OF FINANCE

Production and Thrift

GAIN or no gain the cause before the farmers of Canada is as clear as it was last year—they must produce abundantly in order to meet the demands that may be made, and I believe this to be especially true in regard to live stock, the world's supply of which must be particularly affected in this vast struggle."—*HON. MARTIN BURRELL, Minister of Agriculture.*

THE FOLLOWING STATEMENTS ARE BASED ON REPORTS CONTAINED IN "THE AGRICULTURAL WAR BOOK, 1916," PUBLISHED BY THE DEPARTMENT OF AGRICULTURE, OTTAWA, ONT.

LIVE STOCK—The herds and flocks of Europe have been greatly reduced. When the war is over there will be a great demand for breeding stock. Canadian farmer : should keep this in mind.

MEATS In 1915 Great Britain imported 664,508 tons of beef, mutton and lamb, of which 364,245 tons came from *without* the Empire. Out of 430,420 tons of beef only 104,967 tons came from *within* the Empire.

The demands of the Allies for frozen beef, canned beef, bacon and hams will increase rather than diminish. Orders are coming to Canada. The decreasing tonnage space available will give Canada an advantage if we have the supplies.

DAIRYING—Home consumption of milk, butter and cheese has increased of late years. The war demands for cheese have been unlimited. The Canadian cheese exports from Montreal in 1915 were nearly \$6,500,000 over 1914. Prices at Montreal Cheese—: January, 1915, 15¼ to 17 cents; January, 1916, 18¼ to 18½ cents. Butter: January, 1915, 24 to 28¾ cents; January, 1916, 32 to 33 cents.

EGGS—Canada produced \$30,000,000 worth of eggs in 1915 and helped out Great Britain in the shortage. Shippers as well as producers have a duty and an opportunity in holding a place in that market.

WRITE TO THE DOMINION DEPARTMENT OF AGRICULTURE AND TO YOUR PROVINCIAL DEPARTMENT FOR BULLETINS ON THESE SUBJECTS

Tens of thousands of Canada's food producers have enlisted and gone to the front. It is only fair to them that their home work shall be kept up as far as possible. The Empire needs all the food that we can produce in 1916.

PRODUCE MORE AND SAVE MORE
MAKE LABOUR EFFICIENT

SAVE MATERIALS FROM WASTE
SPEND MONEY WISELY

THE GOVERNMENT OF CANADA

4

THE DEPARTMENT OF AGRICULTURE

THE DEPARTMENT OF FINANCE

Production and Thrift

CANADA'S CALL FOR SERVICE AT HOME

Produce More and Save More

The Empire needs food. If you are not in the fighting line you may be in the producing line. Labour is limited--- all the more reason to do more than ever before. Grow food for the men who are fighting for you. The Allies need all the food that you can produce. Every little helps. You are responsible for your own work. If you cannot produce as much as you would like, produce all you can. Work with the right spirit. Put fighting energy into your effort and produce now when it counts. The more you produce the more you can save. Producing and saving are war-service.

Make Your Labour Efficient

In war-time do not waste time and energy on unimportant and unprofitable work. Economize labour. Put off unproductive work till after the war, and, if possible, help in producing something needed now. Let us not waste labour. Canada needs it all. If possible help to feed the Allies. Make your backyard a productive garden. Cultivate it with a will. Make your labour count for as much as possible.

Do Not Waste Materials

There should be no waste in war-time. Canada could pay the annual interest on her war expenditure out of what we waste on our farms, in our factories, in our homes. Every pound of food saved from waste is as good as a pound of increased production. The way for a nation to save is for every individual to save. France is strong to-day because of thrift in time of peace. The men and women of Great Britain are not only "doing" but are learning to "do without."

Spend Your Money Wisely

Practise economy in the home by eliminating luxuries. Wasting our dollars here weakens our strength at the Front. Your savings will help Canada to finance the war. Save your money for the next Dominion War issue. There can be no better investment.

THE GOVERNMENT OF CANADA

5

THE DEPARTMENT OF AGRICULTURE

THE DEPARTMENT OF FINANCE

PART I

Dominion Department of Agriculture

**INFORMATION SUPPLIED BY OFFICIALS OF THE VARIOUS
BRANCHES REPRESENTED**

FEDERAL APPROPRIATIONS FOR AGRICULTURE, 1916-17

	\$
Experimental Farms—Maintenance of Central Farm, and establishment and maintaining of additional branch stations	846,000 00
Branch of Entomology	20,000 00
For the administration and enforcement of the Destructive Insect and Pest Act	75,000 00
For the development of the dairying industries, and the improvement in transportation, sale and trade in food and other agricultural products	155,000 00
Towards the encouragement of cold storage warehouses for the better preservation and handling of perishable food products	150,000 00
Fruit Branch	115,000 00
Health of Animals Branch	570,000 00
Dominion Cattle Quarantine buildings—Repairs, renewals, etc	15,000 00
For the administration and enforcement of the Meat and Canned Foods Act	292,000 00
Publications Branch	20,000 00
International Institute of Agriculture, to assist in maintenance thereof and to provide for representation thereat	20,000 00
For the development of the Live Stock Industry	600,000 00
To enforce the Seed Act, to test seeds for farmers and seed merchants, to encourage the production and use of superior seeds, and to encourage the production of farm and garden crops	150,000 00
For the administration and carrying out of the provisions of the Agricultural Instruction Act	25,000 00
Exhibitions	100,000 00
Grant to Dominion Exhibition	50,000 00
For renewing and improving Canadian exhibit at Imperial Institute, London, and assisting in the maintenance thereof	5,000 00
To provide for the conducting of an advertising campaign for "Production and Thrift" through the medium of the public press, and for the holding of meetings in connection with the same	50,000 00
	<u>\$3,258,000 00</u>

APPROPRIATIONS UNDER THE AGRICULTURAL INSTRUCTION ACT

	\$
AUTHORIZED BY STATUTE	
Ontario	301,158.45
Quebec	243,212.23
Nova Scotia	74,859.28
New Brunswick	59,209.60
Prince Edward Island	30,443.75
British Columbia	63,732.50
Manitoba	70,767.21
Saskatchewan	74,869.76
Alberta	61,747.22
Veterinary Colleges	20,000 00
	<u>\$1,000,000 00</u>

THE DOMINION EXPERIMENTAL FARMS

THE DIVISION OF HORTICULTURE

HORTICULTURE AT THE DOMINION EXPERIMENTAL STATION, MORDEN, MANITOBA

BY W. T. MACOUN, DOMINION HORTICULTURIST

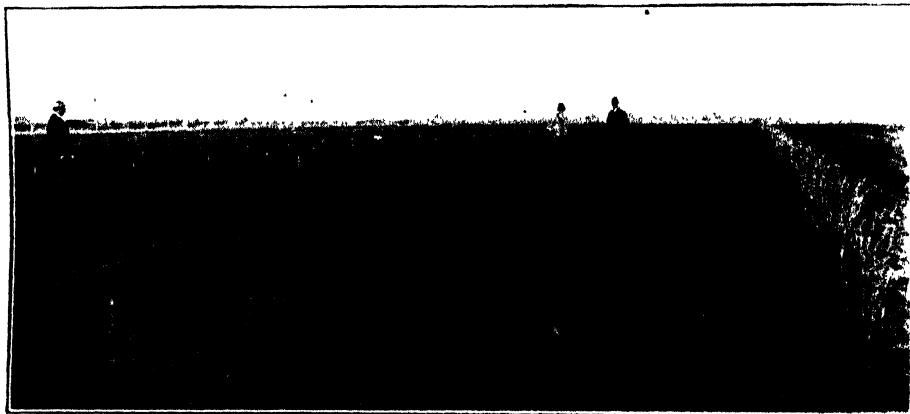
THE new Experimental Station for Southern Manitoba is situated close to the town of Morden, and occupies about 285 acres of land. At this station, it is proposed to make horticulture a leading feature of the work.

During the past twenty-five or thirty years Mr. A. P. Stevenson of Morden has demonstrated the possibility of growing apples, plums and other hardy fruits successfully in

minion Department of Agriculture considered it desirable to make extensive experiments with fruits in Southern Manitoba.

While the orchards which have been developed by Mr. Stevenson are well protected by trees, the experimental station has no protection, hence, it was necessary to at once plant something that would break the force of the winds.

In the spring of 1915, hedges of the



LAYING OUT THE FIRST APPLE ORCHARD AT THE EXPERIMENTAL STATION, MORDEN, MANITOBA, APRIL, 1916

Southern Manitoba. Other persons have also grown these fruits on a small scale. Mr. Stevenson, however, has shown by his experience that apple orchards on a commercial basis can be established and good fruit produced if proper care is taken of the trees, he having obtained a crop of about 200 barrels of apples in his orchards.

Being familiar with the success of Mr. Stevenson and others, the Do-

Siberian Pea Tree, *Caragana arborescens*, running east and west were set out 90 feet apart across a ten acre field in which the first orchard was to be planted. Willow hedges were also planted for additional protection. These hedges made good growth in 1915, and it was considered desirable to plant the fruit trees and bushes in the spring of 1916.

Fruits which had succeeded in

Manitoba were ordered from Manitoba nurserymen and shipped to Morden. Included in these were the hardy Russian varieties of apples, Hiberna, Blushed Calville, Anisette, Duchess and others which have been fruited by private individuals at and near Morden. Additional material

Dr. Saunders' first crosses. There were also many other named varieties of apples and other fruits from Ottawa. In addition to the named fruits from Ottawa, some 25,000 yearlings raised from seed of the hardiest Russian and American apples were sent, and these with seed-



OPENING DEEP FURROWS WITH THE PLOUGH BEFORE PLANTING SMALL SEEDLING APPLE TREES

was also sent from Ottawa, among which were many new untried varieties originated by the late Dr. Wm. Saunders, and especially intended for prairie conditions. The fruit of these is larger than that of

lings grown from the hardiest apples which have already fruited at Morden will give a fine lot from which to select hardier and better sorts. The arrangement of planting is such that these seedlings planted closely



SOLDIERS ASSISTING AT THE PLANTING OF SMALL SEEDLING APPLE TREES. NOTE CARAGANA HEDGE AS WINDBREAK IN FOREGROUND

together will help to protect the grafted trees in the permanent positions while other windbreaks are growing. Experiments in winter protection of individual trees, and cultural experiments, are being planned.

Experiments with bush fruits, and strawberries, vegetables, and flowers are all under way at Morden this year.

The writer visited Morden during the last week of April and assisted in the laying out and planting of the first orchard. The work of planting

the many thousand apple seedlings was very rapidly performed. Deep straight furrows nine feet apart were opened with the plough and the little seedlings were planted one foot apart in these. The permanent trees are 18 x 18 feet apart. In order to get the planting done in as short a time as possible soldiers stationed at Morden were obtained to assist in the work. Mr. S. A. Bjarnason, B.A., B.S.A., formerly Assistant to the Superintendent, Experimental Farm, Brandon, Man., has been placed in charge of the horticultural work.

THE TOBACCO DIVISION

CHANGES IN STAFF

Several changes have been made in the staff of the tobacco division. Grover C. Routt, B.S.A., M.S., who has been with the division for the past two years, has been appointed plant breeder and pathologist for the division. H. A. Freeman, B.S.A.,

M.S., has been appointed inspector for Ontario. Dudley D. Digges, B.S. M.S., has been appointed superintendent of the Harrow tobacco station. All three officials have had experience in the Southern States.

THE ENTOMOLOGICAL BRANCH

SOME STEM MAGGOTS ATTACKING GROWING GRAIN

BY NORMAN CRIDDLE, FIELD OFFICER, DOMINION ENTOMOLOGICAL LABORATORY, TREESBANK, MAN.

THE relation of insects to growing grains is a problem of no little importance, and one that has attracted the attention of economic entomologists from early times. The yearly toll taken from growing wheat and barley by the Hessian fly in North America alone aggregates millions of dollars, and when we add to this such well-known pests as the Wheat Midge, Joint Worm, Western Wheat-stem Sawfly, Cutworms, Army-worms, Wireworms, Chinch bug and Grasshoppers, it will be seen what a large array of enemies the farmer has to contend against even in the rearing

of cereals. Nor is this by any means all, several less known, but scarcely less important, grain insects are constantly with us and it is proposed in this article to deal with some of these, comprising a number of small flies.

The family Oscinidæ to which the small flies mentioned above belong, embraces numerous genera and many species, the largest individuals of which do not exceed a quarter of an inch in length, while the smallest are much less than half that size. Taken collectively they are almost world-wide in their distribution, and certain genera, at least, are

well known grain pests both in the Old and New Worlds. Whether any of our species have actually been introduced from Europe is doubtful. True, such well-known names as the Frit fly (*Oscinis frit*) have figured in our literature more than once, but according to at least one of the leading authorities, there is a reasonable doubt as to the correct identity of the species involved. We know this much at all events, that our native grasses harbour many different kinds and that these live and multiply just as readily in wild grasses as in cultivated grain crops. We may, in fact, reasonably suspect that these small maggots have, like the Western Wheat-stem Sawfly, taken advantage of the abundance of food made available by the introduction of cereals and so from being of no economic importance whatever they have become pests of considerable magnitude.

A perusal of our literature shows that Oscinid flies have figured quite prominently therein for many years past and that at times, they have reached proportions sufficient to cause serious losses to crops, while at other periods they have dwindled to quite insignificant proportions. The fact remains, however, that they are always with us, and a study of their habits in Manitoba has led to the conclusion that the yearly loss through this agency is far in excess of what it was previously thought to be.

It is not perhaps surprising that injury by Oscinid flies is usually overlooked by the average farmer, or, if observed, credited to other causes. An uneven patchy looking crop in late May, of the spring wheat, the low lying land showing even a more sparse growth than the hills, may be put down to many causes, Hessian-fly, Wireworms, White grubs or even a failure of the seed to germinate. A closer inspection, however, will easily determine this point. A row of dried-up plants in which all the leaves are dead can safely be classed as the work of some underground

feeder such as Wireworms or White grubs. If the latter, however, the plants will be cut off cleanly at least an inch below the surface, whereas in the case of Wireworms they are more apt to be left hanging while the young stem is chewed for some distance up. In the case of Wheat-stem maggots (*Oscinidæ*) the larvæ usually attack the central shoot, cutting it off near its base while the outer leaf nearly always remains green. A little experience will enable any ordinary observant person to recognize these differences; but when we come to separating the injury of Wheat-stem maggots from that of Hessian fly the task is more difficult, though observation even then will indicate that the plant when attacked by the latter usually withstands the infestation better in the first place and in dying gradually changes from the ordinary colour to blueish green and so to yellow and brown. In winter wheat or rye the methods of attack by Wheat-stem maggots are similar to their work in spring grains but the injury is more difficult to detect owing to the plants being larger and so able to better withstand attack.

The above description of injury caused by *Oscinidæ* in spring time in reality embraces the work of several kinds which are so much alike that as yet but few of them can be separated in the larval stages. Their methods of attack also differ very little so that we can conveniently include them all in this summary of their habits.

In the succeeding generations the injury by Oscinid flies is quite unlike that of Hessian-fly. The summer attack of the latter is always recognized by the bending of the straws just above one of the joints, usually the second. Whereas in the former the maggots still prefer the lower portion of the plant, consequently the only member of the *Oscinidæ* likely to be confused with the Hessian fly at this time, is the Greater Wheat-stem maggot, (*Meromyza americana*). With this fly the

spring attack does not differ from that of the Lesser Wheat maggots (*Oscinis* spp.). The larva, however, is larger, nearly a quarter of an inch long, and, moreover, is greenish, whereas the larvæ of Oscinids are whitish.

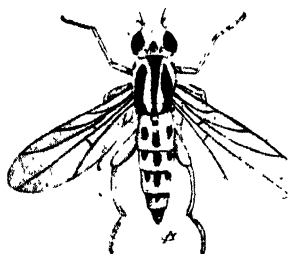


Fig. 1. Adult of the Greater Wheat-stem maggot *Meromyza americana*. Colour greenish yellow with black markings. Much enlarged. (Original.)

In the summer brood the Greater Wheat-stem maggot attacks plants just above the topmost joint, causing the well known "white heads" but never a bending of the stems. Its work at this time is frequently confused with the Western Wheat-stem Sawfly (*Cephus* sp.), but in this last the straws are tunneled through the joints, while they never are so injured by the former. This second brood of the Greater Wheat-stem maggot takes place in July and early August and the flies from it emerge towards the end of the latter month and on into September. They then fly to any green growth of the grass family available, upon which they deposit their whitish, elongate eggs. Young growth is preferred, and, a little later, larvæ may be found in fall wheat or rye, volunteer cereals, Brome grass, Western Rye grass, Blue grass, Timothy and various wild species. In the prairie provinces larvæ of this generation pass the winter low down in the plants to transform to pupæ and adults the following spring. In exceptional cases a few flies emerge in October, but the number seems in-

significant. Of the smaller flies (*Oscinis* spp.) less is known. There is certainly a brood attacking fall cereals, as well as the summer one, but whether these pass through all their stages and emerge to form a fourth brood is doubtful.



Fig. 2. Showing injury caused to wheat by Wheat maggots. (a) Shows a "White head" caused by the Greater Wheat-stem maggot *Meromyza americana*. The arrows indicate the position of the larva beneath the sheath. (b) Same, the straw sheath removed. (c) Usual condition of spring wheat after being attacked by Wheat maggot; note single green leaf. All natural size. (Original.)

Of the true *Oscinis* spp. but three have as yet been reared from growing grain in Canada; namely, *Oscinis variabilis* Loew., *O. coxendix* Fitch and *O. dorsata* Loew. Several others, however, occur in native grasses. Both *variabilis* and *coxendix* are abundant species in Canada. In Manitoba we have found the latter literally in millions upon sheaves of oats in August. It was also the commonest throughout the entire autumn months, being collected up to

the time of the first winter snow. Combining these habits with the fact that flies are again plentiful within 24 hours of the departure of snow in spring time, we might reasonably conclude that this species hibernates in the adult form.



Fig. 3. *Oscinis cozendix*. An adult of one of the commonest grass and grain stem maggots much enlarged. (Original.)

While Oscinid flies breed in nearly every grain field they are, nevertheless, more numerous in some fields than in others, a fact that is usually accounted for by the conditions under which they are living. For instance, summer-fallow upon which no volunteer growth is permitted will be less liable to attack the following spring than similar land upon which there was an autumn growth of any grain. As a rule the most severely infested fields are grass lands that have been ploughed down late in the fall or in the spring and then sown to cereals. In this case the grass has proved an excellent breeding medium for the flies, which, on emerging in the spring, find a convenient growth of grain available upon which they naturally deposit their eggs. It is also in such lands that Wireworms and White grubs breed most frequently. The combined attack often results in a crop failure. Fields of grain next to grass lands are also apt to suffer,

but less so than when the grass has actually been ploughed down and sown to grain. In the case of winter wheat or rye the attack is usually more severe than to spring-sown crops, owing to the fact that the flies are able to establish themselves in the crops during the previous fall, and on emerging in the following May find an abundance of living plants close at hand in which to breed.

REMEDIES

Under ordinary conditions very little can be done after the crop has been sown. Consequently reliance must be placed in preventive measures which may be summarized as follows:

(1) The prevention of volunteer growth in autumn, particularly upon summer-fallow. It is upon such growth that the flies breed and so remain at hand in readiness to infest the next year's crop.

(2) Summer-fallow grass lands in preference to ploughing them in either fall or spring. Or when it is necessary to adopt one of the latter methods, the land should be ploughed deeply and packed to prevent the flies making their way through.

(3) Since newly ploughed grass-land is sure to harbour various insect pests a thicker sowing is suggested to overcome the thinning out, which always take place. It is also desirable to sow either rye or oats in preference to wheat, as both grow more rapidly and can more easily withstand attack by insects.

(4) *Well prepared land and the best seed will result in vigorous growth; vigour means strength and strength power to resist attack. Anything that can be done, in reason, to attain this end will be to the advantage of the agriculturist and will lessen the injury by insects.*

THE DAIRY AND COLD STORAGE BRANCH

SPECIAL REFRIGERATOR CAR SERVICES

FOR BUTTER

THE transportation of dairy products under proper conditions as regards temperature, sanitation, etc., is a matter of very great importance to the dairymen of this country, as no matter how fine in quality butter may be when it leaves the hands of the producer, its value will be very considerably reduced if it is allowed to deteriorate during transit from the farm or creamery to the place where it is to be marketed. On the other hand it seems necessary to say that if butter is not of first class quality, and in good condition when it is delivered to the carrier, the finest transportation system that could be devised will not improve it.

On account of its importance as a factor in the welfare of the dairying industry the Dairy and Cold Storage Commissioner has been authorized for a number of years past to arrange annually with the railway companies for a special weekly or fortnightly refrigerator car service for butter during the period from about the beginning of the second week in May until the middle of October. The agreement provides that the Department shall authorize the services that are to be supplied, stating the starting point and destination, and whether a service is to be weekly or fortnightly. The schedule is drawn up by the railway company, giving the days on which the various cars will be run and the approximate time at which they will arrive and depart from the principal shipping stations en route. The Department is obliged to guarantee two-thirds of the earnings at the carload tariff rate (minimum

20,000 pounds), plus \$4 per car for icing; this latter sum being considered the equivalent of two-thirds of the cost of icing a car for an ordinary run. All revenue from the butter carried by each car is credited against the guarantee, and in a great many cases the cars are operated without any deficit. All these special services, however, come under the supervision of the Department, whether the services are self-sustaining or not. Any car arriving at its destination without ice in the bunkers is not entitled to the Department's guarantee, and whatever deficit there may be in the operation of that particular car the loss is borne by the railway company.

For a number of seasons subsequent to the year 1900, the Department maintained travelling inspectors, who accompanied these cars on their various routes for the purpose of testing the temperature of the butter when delivered to the cars at the different railway stations, and marking these packages so that they could be tested again at the terminal point. Another object in view was the gathering of data to show the temperature at which this butter was loaded into the car, so as to impress upon the creamerymen the undesirability of sending their butter to the station before the arrival of the refrigerator car and leaving it on the station platform, where it was exposed to extreme heat for a considerable length of time. After a few years of the work of these travelling inspectors very considerable improvement was noted in the temperatures at which the butter was loaded in the refrigerator cars, and their services were discontinued. Each year, however, inspectors are

employed at the railway terminals in Montreal and Toronto to report the condition of these special cars on arrival, the quantity of ice in the bunkers, the manner in which the cars are loaded, the temperature of the butter, etc. Daily reports are made to the office of the Dairy and Cold Storage Commissioner and any defect or deficiency in the service is at once brought to the attention of the railway concerned. During hot weather constant supervision is necessary in order to keep the icing up to the required standard, but, on the whole, an efficient service is provided by the railway companies.

For 1916, these special iced butter car services began during the week commencing May 8th, and will terminate on October 7th. In Ontario cars will be started at the following points with Toronto as their destination:—

Via C. P. R.—Windsor, Goderich, Owen Sound and Teeswater.

Via G. T. R.—Warton, Southampton, Kincardine, Goderich, Forest, Exeter, London, Petrolia, St. Thomas, Elmvale, Orillia and Kinmount Junction.

One car per week is also operated by both the C.P.R. and G.T.R. from Toronto to Montreal.

In Quebec, cars will be started at the following points with Montreal as their destination:—

Via I. C. R.—Matapedia, Bonaventure via Matapedia (ex. Q. O. R.), Mont Joli, Mont Joli (ex. C. & G. T. R.), Riviere du Loup, Chaudiere Junction and Monk (fortnightly).

Via C. N. R.—St. George, Joliette, Montfort Junction and Charette.

Via C. P. R.—Mansonville and Windsor Mills, Bedford, Knowlton, Sherbrooke, West Shefford, Spring Hill and Cookshire, Wickham, St. Guillaume, Quebec, Mont Laurier (fortnightly), St. Lin & St. Eustache, St. Gabriel, St. Hermas and West Brome.

Via C. V. R.—Frelighsburg, St. Armand and Waterloo.

Via Q. C. R.—Megantic, St. Camille and St. Henedine.

Via Q. M. S. R.—Iberville Junction and St. Lambert.

Via G. T. R.—St. Agapit, Coaticook, Upton, Richmond, Stottsville (fortnightly), St. Agnes, Hemmingford, Aubrey, Golden Lake, Noyan Junction and St. Polycarpe Junction.

In Quebec, cars will be started at the following points with Quebec city as their destination:—

Via I. C. R.—Mont Joli.

Via Q. C. R.—Tring Junction.

Each year also an iced butter car is operated by the Dominion Atlantic Railway from Yarmouth to Halifax, for the period from about the middle of June to the first week in September.

The cars arriving at Quebec and Halifax are inspected by an officer of the Department of Agriculture.

FOR CHEESE

From about the middle of June until the end of the first week in September, a somewhat similar arrangement is in force with the railway companies for the operation of refrigerator cars for the carriage of cheese to Montreal and Quebec, with the exception that there is no guarantee of earnings by the Department. It is agreed that the Department will pay the cost of icing up to \$5 per car on a limited number of cars per week on all railways operating in cheese producing districts. For instance, fifty cars per week are allotted on the C.P.R. and a similar number on the G.T.R. system. The other lines are allotted a smaller proportionate number each week. The idea back of this special cheese car service was to demonstrate to the factory men and shippers the benefits that would be derived by the use of iced refrigerator cars for the carriage of cheese in hot weather. It is hoped that after a few years more the necessity of using iced refrigerator cars for the carriage of cheese in hot weather will be readily recognized by the shippers, and that payment of icing charges by the Department will no longer be required.

FOR FRUIT

An agreement with the railway companies, similar to that in force for cheese, is made each year for the

carriage of fruit to Montreal and Quebec for *export only*. This is effective for only a limited time, namely, from the middle of August until the end of September.

INSPECTION OF DAIRY PRODUCTS

BY J. F. SINGLETON, CHIEF INSPECTOR OF DAIRY PRODUCTS

A staff of six inspectors located at different points throughout the Dominion is engaged in the work of inspection of dairy products.

The work falls naturally under four heads:--

(a) Inspection of butter for adulteration either with excessive water (more than sixteen per cent) or with fats other than milk fat;

(b) Inspection of weights of prints or blocks of butter;

(c) The proper marking or branding of creamery, dairy, and whey butter;

(d) The proper marking or branding of cheese made from milk which has been skimmed or partially skimmed.

The preliminary examination of butter for excessive water is made by the inspector. If this preliminary examination shows an excess of water, a properly sealed sample is submitted to a chemist for analysis. If the findings of the analyst substantiate those of the inspector a prosecution follows, provided circumstances indicate that the adulteration is due to intent to defraud and is not accidental. During the year ending March 31st, 1916, more samples were examined by the inspectors than during the previous year, and fewer samples were found to be adulterated.

The inspection of weights of prints or blocks of butter is made by means of a sensitive weighing beam carried by the inspector, and is usually made at the time of taking the samples for examination for adulteration. If prints are found to be running under weight, the manu-

facturer or cutter is usually for a first offence let off with a warning. If the warning does not have the desired effect, and the prints continue to run light in weight, a prosecution follows. There has been during the past year a decided improvement in the weights of prints or blocks of both dairy and creamery butter.

The new regulation regarding the marking of dairy butter as such, when put up in prints and wrapped in parchment paper, or in boxes similar to those used for the packing of creamery butter, is being generally observed.

Very little cheese is made in Canada from milk which is skimmed or partially skimmed. Cheese made from such milk is required to be marked or branded with the words "Skim-milk Cheese" both on the side of the cheese and on the side of the box containing the cheese. Two violations of this regulation came under the notice of the inspectors during the past year, both of which were successfully prosecuted.

During the past year, thirty-four convictions for violations of the Act have been registered, as compared with forty-four convictions during the previous year.

The work of inspection of dairy products should protect the honest manufacturer and dealer from unfair competition, as well as protect the consumer, by the prevention of adulteration and misrepresentation. That is, the work should be preventive rather than punitive. In this

respect, it is gratifying to note such an improvement in the weights of blocks or prints of butter, and also that although the number of samples examined for adulteration was greater than that of the previous

year, fewer samples proved to be adulterated and fewer prosecutions were necessary. It is to be hoped that by constant and efficient inspection the number of prosecutions may be reduced from year to year.

GRADING CREAMERY BUTTER IN THE PRAIRIE PROVINCES

BY GEORGE H. BARR, CHIEF, DAIRY DIVISION

AN important dairy conference which was arranged for by the Dominion Dairy and Cold Storage Commissioner, was held in Regina, Sask., on May 10th, for the purpose of securing greater uniformity in the grading of creamery butter in Alberta, Saskatchewan and Manitoba.

This conference was the first of its kind held in Canada and the results were so satisfactory that all the delegates were strongly in favour of making it an annual affair. The following were in attendance: Geo. H. Barr, Chief, Dairy Division, Ottawa; C. Marker, Dairy Commissioner, Alberta; J. W. Mitchell, Dairy Commissioner, Manitoba; W. A. Wilson, Dairy Commissioner, and F. C. Logan, Assistant Dairy Com-

missioner, Saskatchewan. There were also present:—Provincial Graders: H. S. Pearson and J. Flann for Alberta; Prof. G. K. McKay and J. R. Crowe for Saskatchewan, and L. A. Gibson for Manitoba.

The conference was held in the Regina Cold Storage where 23 samples of butter were provided for scoring. Three of these samples were sent by the Merchants' Produce Association, Montreal; five came from Manitoba; eight from Alberta and seven from Saskatchewan.

These samples were scored by the official graders according to the scale of points used in grading in each province at the present time, the minimum for flavour and total score being as follows:

FIRST GRADE:

	Flavour	Total Score
Alberta	39 out of 45	91 out of 100
Saskatchewan	39 " 45	92 " 100
Manitoba	40 " 45	91 " 100

SECOND GRADE:

Alberta	37 out of 45	87 out of 100
Saskatchewan	37 " 45	84 " 100
Manitoba	37 " 45	85 " 100

Such differences as occurred in placing the samples in first and second grades were due more to the difference in the scale of points used in the different provinces, than to a difference in the judgment of the graders. There was only one sample of third grade butter and it was placed in third grade by all the graders.

The most interesting feature of the conference took place when the

highest scoring samples of butter from each province and from Montreal were placed together for comparison. Although all these samples were first grade, the differences in colour and flavour were sufficiently marked to provoke a long and valuable discussion. The pale colour apparently so desirable for the coast trade, was considered by some delegates too pale for the local markets in Manitoba and Montreal, and also

difficult to secure during the summer months when the cows are on grass. This point is one which will require time to adjust. The general opinion of the conference was that the coast trade if supplied with the finest flavoured butter might in time accept a slightly deeper shade than that which is at the present time so popular, and that the Eastern markets might very well accept a butter of a lighter shade in colour than that usually made in the eastern provinces, thus eliminating the necessity of making the butter specially for a certain market.

The main point of difference regarding the flavour of the highest scoring samples was their keeping quality. This point could be decided only by holding the samples and, at the request of the delegates, the Dairy Division, Ottawa, decided to place five of the samples in cold storage in Montreal and have them scored from time to time for at least six months. Three of these samples were made from pasteurized cream and the other two from raw, sweet cream.

After the scoring and discussion on the quality of the butter, the conference settled down to discuss the question of uniform grades in the three provinces. The outstanding point of difference was the variation in placing the samples in first and second grades. This, as stated before, appeared to be due more to the score points used than to the judgment of the graders.

The conference finally decided to adopt the following uniform scale of points for the different grades: total score 100, total score for flavour 45. Alberta will continue to have a "Special" grade, the minimum score for which will be 42 points out of 45 for flavour and a total of 94 points out of 100. The minimum score for first grade will be 39 points for flavour and a total of 92 points. The minimum score for second grade will be 37 points for flavour and a total of 87 points.

With this uniform standard of grading there should be very little difference in the quality of the butter in the same grades in the three prairie provinces.

THE LIVE STOCK BRANCH

THE WOOL EXHIBIT

BY T. REG. ARKELL, B.S.A., B.Sc.

APPPLICATIONS have been received from a large number of Canadian fairs for the presentation of the wool exhibit. It has been necessary to arrange, in consequence, a very extensive itinerary which commences at Orms-town in early June and then follow in order: Calgary, Edmonton, Brandon, Regina, Saskatoon, Valleyfield, Three Rivers, Quebec, Sherbrooke, Halifax and Charlottetown. An exhibit will also be placed at Toronto, the dates of which coincide with Quebec and Sherbrooke, and this will subsequently be divided be-

tween London and Ottawa.

Many new features have been added. One of the most important will include practical demonstrations in wool grading, sorting, folding and tying fleeces. A very complete line of foreign wools used in manufacture in Canada has also been secured this year and the processes of woollen and worsted manufacture are illustrated, not only by samples representing intermediate products from the wool in the fleece to the finished cloth, but by photographs of the actual operations.

THE RECORD OF PERFORMANCE

DURING the past year the Record of Performance has made progress. As shown in the following tables, increases have been made both in the number of

cows for which applications have been received for entry in the Record of Performance test for pure-bred dairy cows, and in the number of cows qualifying:



AYRSHIRE COW, BETSY BROWN, 30,888

NUMBER OF COWS ENTERED IN RECORD OF PERFORMANCE TEST

Holstein	713	Increase as compared with last preceding year	72
Ayrshire	677	" " " " " " " "	190
Jersey	198	" " " " " " " "	39
Guernsey	19	Decrease " " " " " " " "	11
French-Canadian	43	Increase " " " " " " " "	26
Shorthorn	121	" " " " " " " "	44
Total	1,771		

NUMBER OF COWS QUALIFIED

Holstein	233	Increase as compared with preceding year	36
Ayrshire	175	" " " " " " " "	52
Jersey	57	" " " " " " " "	22
Guernsey	7	Decrease " " " " " " " "	2
French-Canadian	8	" " " " " " " "	6
Shorthorn	34	" " " " " " " "	2
Total	514		

CLASSIFICATION OF ANIMALS

For the purpose of the test the following classification of animals is used:
 Cows from 2 to 3 years old shall be in a class known as 2-year-old.
 Cows from 3 to 4 " " " " " " " " 3-year-old.
 Cows from 4 to 5 " " " " " " " " 4-year-old.
 Cows 5 years old and over " " " " " " " " mature.

Following are the names, records and owners of highest producing cows in each of the breeds and classes:

JERSEY

Mature:

"Sunbeam of Edgeley", 629, 18,744 lb. milk; 926 lb. fat. Owned by Jas. Bagg & Son, Edgeley, Ont.

Four-Year-Old:

"Brampton Graphical Happiness", 2547, 10,004 lb. milk; 536 lb. fat. Owned by John Pringle, London, Ont.

Three-Year-Old:

"Springbank Butter Girl", 4045, 12,544 lb. milk; 608 lb. fat. Owned by D. A. Boyle, Woodstock, Ont.

Two-Year-Old:

"Fanny of Edgeley", 2828, 7,939 lb. milk; 424 lb. fat. Owned by Alfred Bagg, Edgeley, Ont.

SHORTHORN

Mature:

"Coquette 2nd", 107052, 17,723 lb. milk; 636 lb. fat. Owned by Edward Knight, Vanessa, Ont.

Four-Year-Old:

"Iford Waterloo Baroness", 104584, 10,410 lb. milk; 381 lb. fat. Owned by Ontario Agricultural College, Guelph, Ont.

Three-Year-Old:

"Barbara", 96741, 11,208 lb. milk; 437 lb. fat. Owned by W. B. Affleck, Middleville, Ont.

Two-Year-Old:

"Jean Lassie", 104803, 8,939 lb. milk; 371 lb. fat. Owned by S. A. Moore, Caledonia, Ont.



JERSEY COW, SUNBEAM OF EDGELEY, 629

GUERNSEY

Mature:

"Island Beauty", 985, 9,814 lb. milk; 494 lb. fat. Owned by Dr. Knight, Sardis, B.C.

Four-Year-Old:

"Heiress Daisy", 318, 8,182 lb. milk; 364 lb. fat. Owned by D. G. McKay & Son, Heath Bell, N.S.

Three-Year-Old:

"Western Queen", 834, 10,153 lb. milk; 576 lb. fat. Owned by Banford Brothers, Chilliwack, B.C.

Two-Year-Old:

"Gladys of Willow", 654, 10,234 lb. milk; 544 lb. fat. Owned by Banford Brothers, Chilliwack, B.C.

FRENCH CANADIAN

Mature:

"Florida", 1353, 9,872 lb. milk; 514 lb. fat. Owned by D'Arcy Scott, Ottawa, Ont.

Four-Year-Old:

"Domnonee", 3620, 7,491 lb. milk; 359 lb. fat. Owned by Ferd. Van Bruyssel, Beaupre, Que.

Three-Year-Old:

"Maid of Two Mountains", 2200, 6,947 lb. milk; 344 lb. fat. Owned by D'Arcy Scott, Ottawa, Ont.

Two-Year-Old:

"Fannie", 2550, 5,150 lb. milk; 251 lb. fat. Owned by D'Arcy Scott, Ottawa, Ont.

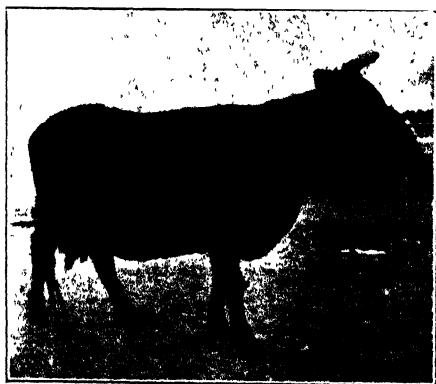
AYRSHIRE

Mature:

"Betsy Brown", 30,888. 15,178 lb. milk; 646 lb. fat. Owned by A. S. Turner & Son, Ryckman's Cors., Ont.

Four-Year-Old:

"Snowflake of Glenwood", 43649, 12,561 lb. milk; 533 lb. fat. Owned by O. F. Medwin & Son, Greenville, Ont.



FRENCH CANADIAN COW, FLORIDA, 1353

Three-Year-Old:

"Milkmaid of Orkney" 39834, 14,060 lb. milk; 534 lb. fat. Owned by Harmon MacPherson, Orkney, Ont.

Two-Year-Old:

"Lenore 2nd", 38514, 12,052 lb. milk; 524 lb. fat. Owned by Harmon MacPherson, Orkney, Ont.

HOLSTEIN-FRIESIAN

Mature:

"Toitilla of Riverside", 12254, 24,094 lb. milk; 846 lb. fat. Owned by Jos. O'Reilly, Peterboro, Ont.

Four-Year-Old:

"Baroness Madoline", 16299, 21,149 lb. milk; 773 lb. fat. Owned by Wm. Stock, Tavistock, Ont.

Three-Year-Old:

"Plus Pontiac Artis", 16792, 21,018 lb. milk; 792 lb. fat. Owned by S. Lemon, Lynden, Ont.

Two-Year-Old:

"Mildred Pieter je Abbekerk", 21509, 18,122 lb. milk; 549 lb. fat. Owned by L. de L. Harwood, Vaudreuil, Que.

THE HEALTH OF ANIMALS BRANCH

ORDERS RESPECTING FOOT AND MOUTH DISEASE, IMPORTS OF ANIMALS, ETC.

UNDER the provisions of "The Animal Contagious Diseases Act," for the period of three months from May 3, 1916, the following regulations will govern the importation into Canada of animals or their products, or of hay, straw, fodder or manure from the State of Illinois:—

(1) Cattle, sheep, goats and swine are prohibited.

(2) Horses may be admitted upon the receipt of a special permit from the Veterinary Director General. Owners should make application for a permit before shipping.

(3) Dogs, other than those used for herding cattle or sheep, may be admitted; also cats, pet birds, live pigeons, and wild or menagerie animals, except deer.

(4) Live poultry is prohibited, except birds for exhibition, or pure bred poultry for breeding.

(5) Cured and cooked meats, butter and eggs may be imported.

(6) Dressed meats, fresh or cured, with the exception of heads, tongues, and feet, will be admitted when accompanied by the export certificate of the Bureau of Animal Industry and consigned to an establishment under federal inspection.

(7) Hides must be accompanied by a certificate of disinfection signed by an officer of the Bureau of Animal Industry. Less than car loads will not be admitted.

(8) Pickled pelts of sheep and goats, also skins of wild fur-bearing animals, tanned or untanned, may be admitted.

(9) Tanned sheep and goat skins with wool attached must be accompanied by certificate of disinfection signed by an officer of the Bureau of Animal Industry.

(10) Wool may be admitted under the following conditions:—

(a) When accompanied by a certificate of disinfection signed by an officer of the Bureau of Animal industry.

(b) Pulled wool, scoured and dried at a temperature of not less than 160° F. and accompanied by affidavit of shipper to that effect.

(c) Foreign wool, ex-warehouse in Illinois, in original bales, and accompanied by affidavit of warehouseman that it has not been in contact with other wools.

(11) Hair and feathers may be admitted when accompanied by certificate of disinfection by an officer of the Bureau of Animal Industry.

(12) Hay, straw, other fodders and manure are prohibited.

(13) Fragile merchandise packed in hay or straw must be accompanied by a certificate, signed by a Bureau of Animal Industry officer, that the packing material has been disinfected. In default of this, permission may be granted by the Veterinary Director General for the delivery of the goods on the undertaking of the importer to burn the packing material as soon as received.

(14) Sterilized manure may be permitted transit through Canada from points in Illinois to destinations in the United States, provided it is contained in bags, boxes or barrels, and shipped in sealed box cars, and accompanied by a certificate of sterilization signed by an officer of the Bureau of Animal Industry.

(15) Transit through Canada of cattle, sheep, goats and swine from the Union Stock Yards, Chicago, to United States points is permitted under the following conditions:—

(a) Shipments must be accompanied by a certificate of health signed by an officer of the Bureau of Animal Industry.

(b) Cars must be clean and provided with 10-inch footboards to prevent escape of manure in transit.

(c) Cars must be under seal while in transit through Canada.

(d) Cattle, sheep, goats and swine must not be unloaded in Canada unless special permission is granted by the Veterinary Director General for use of stockyards reserved for this traffic only.

(16) Importation of live animals and their products, also hay, straw and other fodders, from any other state than the state of Illinois is permitted under the ordinary regulations of the Department of Agriculture, but the shipper may be required, if deemed necessary, to produce evidence that the shipment did not originate in the State of Illinois.

Dated at Ottawa, this third day of May, nineteen hundred and sixteen.

GEO. F. O'HALLORAN,
Deputy Minister of Agriculture.

THE FRUIT BRANCH

APPLE PRODUCTION IN ONTARIO IN 1915

BY F. H. GRINDLEY, B.S.A., ASSISTANT TO THE COMMISSIONER

OWING to the number of enquiries which we receive from time to time regarding the quantity of apples produced in Ontario, a special effort was made this year to secure that information. The freight departments of the various railways operating in Ontario were kind enough to give their assistance and in this way we were able to secure from all their stations the quantity of apples shipped. In addition to this it was necessary, in order to arrive at an estimate of the total quantity marketed, to secure from the evaporators and canning factories, figures showing the tonnage used by them. The information we have gathered together in this way is, we think, as accurate as can be obtained by any means.

Next year, we propose to secure this information monthly during the shipping season so that the railways and others concerned will have less difficulty in compiling the necessary figures. Similar information will also be received from the other fruit-growing provinces.

Last season the production of apples in Ontario based on the quantities carried by the railroads of Ontario, and used by the evaporators and canning factories, amounted to 6,286 cars. This does not include any fruit consumed in the local markets of producing districts.

It is only fair to add that the Ontario apple crop in 1915 was not, in our opinion, more than 40 per cent of an average crop.

INSPECTION STATISTICS

THE following table gives comparative statements of the number of lots of Canadian fruit inspected, and the number of packages inspected for the seasons 1912-13 to 1915-16, inclusive.

VARIETY		No. of Lots Inspected	No. of Pkgs. in Lots Inspected	No. of Pkgs. Inspected
1912-13				
Apples	barrels	18,457	1,321,440	80,102
"	boxes	2,101	204,971	33,578
"	baskets	119	16,249	2,719
Crab Apples	boxes	62	12,186	695
"	baskets	17	1,395	660
Pears	boxes	272	36,356	2,202
Peaches	"	65	25,592	1,557
"	baskets	121	18,837	2,139
Plums	"	186	67,751	7,254
Tomatoes	"	264	39,174	6,940
Small Fruits	quarts	1,187	2,264,559	172,945
Total				310,791
1913-14				
Apples	barrels	11,725	799,510	59,643
"	boxes	2,631	341,679	29,879
"	baskets	105	11,908	1,219
Crab Apples	boxes	192	13,250	1,462
Pears	"	977	48,274	8,559
Peaches	baskets	353	60,771	7,564
"	boxes	806	35,494	12,657
Plums	baskets	679	132,159	15,200
Tomatoes	"	173	59,707	7,305
Small Fruits	quarts	736	1,128,907	95,841
Total				239,329
1914-15				
Apples	barrels	8,926	765,445	59,602
"	boxes	2,769	457,055	36,118
"	baskets	191	29,476	3,994
Crab Apples	boxes	38	2,443	951
Pears	"	894	91,121	9,760
Peaches	"	735	183,952	10,035
"	baskets	147	17,797	2,422
Plums	"	643	180,154	12,294
Tomatoes	"	305	103,742	12,171
Small Fruits	quarts	1,162	1,529,598	151,559
Grapes	baskets	244	308,728	22,394
Total				321,300
1915-16				
Apples	barrels	8,882	710,858	60,248
"	boxes	4,297	758,337	46,791
"	baskets	204	14,319	1,797
Pears	boxes	1,062	121,414	8,816
Peaches	"	1,022	270,508	12,575
"	baskets	838	106,569	10,796
Plums	"	998	482,416	22,231
Tomatoes	"	633	200,343	7,926
Small Fruits	quarts	1,724	2,670,984	275,234
Grapes	baskets	260	382,332	11,395
Total				457,809

PART II

Provincial Departments of Agriculture

AGRICULTURE IN CANADA

QUEBEC

BY H. NAGANT, EDITOR OF THE JOURNAL D'AGRICULTURE

THE province of Quebec covers 703,653 square miles, or 450,337,762 acres, including New Quebec, formerly Ungava Territory, the annexation of which in 1912 has doubled the area of the province. It is the largest province of the Dominion.

According to the Census of 1911, the rural population of the province numbered 1,032,618 and the urban population 970,094 a total of 2,002,712. French-Canadians number 1,605,339 or 80.14 per cent of the total population.

The land occupied covers an area of 15,576,809 acres, of which 8,147,633 acres are improved (arable land). Out of this total, 5,204,874 acres are in forests, 560,889 in marshes, 5,399,223 in field crops, 63,216 in vegetables and 36,730 in orchards, nurseries, small fruits, etc.

There are 130,000,000 acres in forests.

Large areas are still open to the settler.

HISTORICAL NOTES

Samuel de Champlain, who had just laid the foundations of the city of Quebec (1608) expressed his faith in the agricultural future of Canada by saying:

"It will be a great grain and grass producing country; first of all it requires farmers."

As early as 1613, he wrote:

"We always had difficulties in haying during the last few years because hay was cut too late. To avoid this, I had the hay at Cape Tourmente cut in the month of August this year."

Cattle were imported in the first days of the colony. In 1626, Champlain established a farm at the foot of Cap Tourmente, for which cattle were sent from Quebec.

THE FIRST FARMER

But the first farmer settler who lived on the produce of the soil was Louis Hébert, an apothecary from Paris, who landed in Quebec in 1617 with his wife and children, and at once started to clear and cultivate the soil on what is now the site of the Cathedral of Quebec, of the Seminary and of this part of the Upper Town extending from Ste-Famille street to the Hotel-Dieu. At that time, that part of the city was called "Hébert's Farm". With a spade as his only tool, he worked and re-worked the soil, until it was ready to receive seed. He threw in the seed from France, planted apple and rose trees and, at last, saw undulating in the breeze, the golden ears, the flowers and fruits from his motherland. The third centenary of the landing of Louis Hébert will be commemorated in Québec in 1917,

and a citizens' committee has been formed to erect a monument to the first farmer of the colony.

The second pioneer in agriculture was Guillaume Couillard, Hébert's son-in-law, who is mentioned by Champlain as being possessor, in 1629, of seven or eight arpents of seeded land.

OTHER PIONEERS

Later came Abraham Martin, who also farmed for a living, 1643-1646,

In the district of Three Rivers, Pierre Boucher encouraged agriculture as Seigneur and as farmer. He claimed that all crops grew well and that he found in the gardens almost all the vegetables and many of the flowers known in Europe.

In Montreal, Pierre Gadois took possession, in 1648, of the land on which the Ste-Anne market is now situated and became one of the first habitants. Let us also mention among the first settlers the names of



RESIDENCE, BARNS AND STABLES OF M. PAPHUS BONIN, STE. ELIZABETH, JOLIETTE COUNTY, QUEBEC

the land which was subsequently known as "Plains of Abraham", and which became (in 1759), the battlefield of the armies of Wolfe and Montcalm.

Another early pioneer, Robert Giffard, also gave his time to agriculture, and we are told that he grew large crops of wheat, peas and corn. So much for the Quebec district.

Maisonneuve, Simon Richomme, Blaise Guillet, Léonard Lucault, François Godé. The blood of these pioneers of agriculture still runs in the veins of a large number of Canadian families, who are proud to claim them as ancestors.

The land produced good crops: "Providence has so blessed our labours", wrote Reverend Mère de l'Incarnation, Supérieur of the Ursu-

lines at Québec, in 1650, "that the land gives very good wheat and in sufficient quantity. The air is warmer now that the land is cleared and that those great forests which kept it so cold have been partly removed."

AGRICULTURAL ORGANIZATION

The agricultural organization of the province covers three phases of development:

Seigneuries.—As late as 1626 there was no regular system of colonization in New France and the system established on that date was based on what is called the "tenure seigneuriale", similar to that prevailing in old France, but modified according to the circumstances. Two hundred and fifty seigneuries were established under the French régime and four new ones under the English régime. This system, which lasted until 1854, facilitated the organization and the development of the rural population, by insuring its stability and by encouraging its grouping into parishes. At least forty-seven parishes were established between the beginning of the colony and the year 1700. At the present time 275 families are still living on land which was occupied by their ancestors before 1700, living witnesses after eight or ten generations of the energy of the first pioneers, who firmly attached themselves to the soil they had cleared.

Colonization of the Eastern Townships.—While the French-Canadian habitants had established themselves on both shores of the St. Lawrence the district more to the south, and now known as the Eastern Townships, was settled about the end of the 18th century by English farmers or settlers. This settlement which was started in 1774 made some progress between 1784 and 1799, and great progress from 1800 to 1817, when the French element from the seigneuries came to establish themselves in proximity to the

English families which had formed the townships. In 1875, there were a large number of French-Canadians in 36 of the English Townships.

Settlement in our times.—New districts were opened by a third group of settlers, leaving the old settlements towards the middle of the 19th century. In this way were created the first establishments of Lake St. John and Chicoutimi in 1840, Lake Temiskaming in 1860, Matawan Valley in 1863, Matapedia Valley in 1870 and Lake Nominig in 1880.

IMPORTATION OF LIVE STOCK

It is very probable that the first cattle imported by Champlain in 1608 came from Normandy. The French-Canadian cattle, which are now found in pastures of the province of Quebec, came from cattle imported by Champlain. Boucher says:

"In 1663, oxen, pigs, sheep, dogs, cats, turkeys and pigeons were imported from France."

The first horse brought to Quebec in 1647 was presented to the governor, M. de Montmagny. Other horses sent by the King of France, Louis XIV, were forwarded in 1665, 1667 and 1670, and were placed, under certain conditions in charge of the habitants.

The Canadian horse of the 17th century was extremely popular for a period of 150 years, and was looked upon as the best horse in Canada. This was the cause of its disappearance, as the best stallions of the breed were purchased by Americans, only a small number being left, by means of which, however, the breed was reconstituted gradually, thanks to the efforts of enthusiastic agriculturists and of the breeders' association of the province.

Later importations.—The real breed of French-Canadian cattle has had a Herd Book since 1886. There are now in Quebec eight other breeds of cattle. Ayrshires

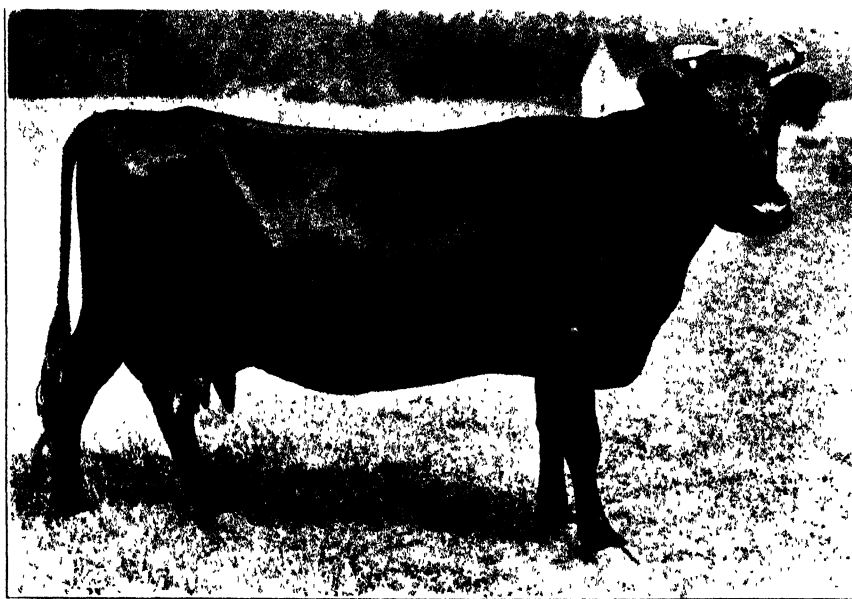
and Shorthorns were imported in 1830, Galloways and Herefords in 1850, Jerseys in 1865, Guernseys and Polled Angus in 1878 and Holsteins in 1881.

As to the horses, with the exception of the Canadian horse, the Clydesdales were imported in 1840, Percherons in 1855, Suffolks in 1868, Shires in 1883, Anglo-Normands, Normands and Bretons in 1889 and Belgians in 1902.

Up to the last forty years the Quebec farmer never kept enough

into the district of Montreal. After 1854, the Cotswolds made their appearance; in 1880, came the Shropshires and, later on, the Ox-fords and Lincolns.

Pigs.—Pigs of the Berkshire breed were imported into the Montreal district in 1835; until then there was only the common breed imported from France. The introduction of other foreign breeds, American and English, such as Chester-White, Essex, Poland China and Yorkshire, is due to the influence of the Board of



FRENCH-CANADIAN COW "FILLIE," 2130, A TYPICAL REPRESENTATIVE OF THE
NATIVE BREED OF CATTLE OF THE PROVINCE

stock on his land. On the other hand, horse breeding was carried on to such an exaggerated extent that Intendant Raudot, in 1709, had to issue a decree with a view to reduce the number of horses and encourage the breeding of cattle.

Sheep.—In addition to the sheep already in the country, American immigrants brought with them grade sheep of various breeds. Towards 1850, Merinos, Leicesters and South-downs were imported from Ontario

Agriculture, established in 1853. The last breed introduced was the Tamworth, a bacon hog which appeared in 1895.

CULTIVATION OF THE SOIL

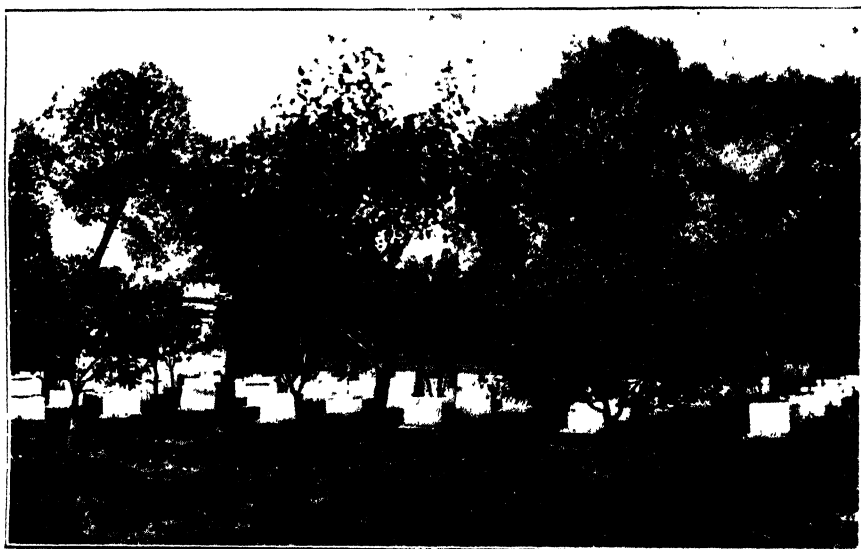
During two centuries and a half, the French-Canadian farmer followed a system which consisted in ploughing half the land in three consecutive years. The greater part of this ploughed area was seeded with cereals, a very small part was

planted in roots, and during these three years the other half was kept for the production of hay and as pasture for the live stock. The pasture was ploughed in the fourth year and the ploughed land was used as pasture for three years, and so on. Very little live stock was kept compared to the area of the farm; some cows and horses, a small flock of sheep and a few hogs and fowls. The small quantity of manure that was produced was applied to the root land. Potatoes, which are now

PERIOD OF TRANSITION

Writes Turcotte in "Le Canada, Sous l'Union:"

"When Canada passed under the English domination, French Canadians numbered about 65,000. They were left in a critical situation by the conquest. Most of them were ruined. They were abandoned by most of their leaders: nobles, influential citizens, officers, educated men, and they lost, owing to this compulsory or voluntary migration, an element of the population valuable by its knowledge and experience. However, they were not to be discouraged. With the help of the Cath-



THE ORCHARD AND APIARY OF M. LUC DUPUIS, VILLAGE DES AULNAIES, COUNTY L'ISLET, QUEBEC

grown in large quantities, were long unknown and were grown for the first time in 1758.

This system was not very scientific, but the soil of New France was so rich that for over a century the Quebec farmers had good crops. Grain, roots and hay were always in abundance and in 1749 they were exported by Quebec merchants. At the beginning of the colony the agricultural industries were flax and wool for clothing, butter, cheese and maple sugar.

olic clergy they isolated themselves from their conquerors and by this fact, from the rest of the universe, to cultivate their devastated lands and worked with energy to repair their losses."

They belonged to a strong and healthy race, these farmers whom the English General Murray admired, in 1762, and whom he found virtuous in their morals and temperate in their mode of living:

"They will become good and faithful subjects of His Majesty and the country in which they live will be before long a rich and valuable colony of Great Britain."

But these valiant farmers resisted all attempts of absorption on the part of their conquerors, and the second English governor, Carleton, writes to Lord Shelburne:

"The Canadian race is so prolific that it will eventually populate this country to such an extent that any other people that will be brought to Canada would be entirely absorbed, except in the cities of Quebec and Montreal."

For almost a century, agriculture, hampered by isolation and the lack of agricultural organization, could not make appreciable progress. In 1850 it was still limited to the growing of cereals without fertilizers and to the growing of hay in meadows that had been seeded to grasses or clovers. The soil which had been so fertile still gave crops, but in decreasing quantity every year, as no manure was ever applied.

Our governors and legislators were too much engrossed by the serious political events which took place almost continuously from 1760 to 1845 to give any attention to agriculture. In 1845, there was, as yet, in the province of Quebec, no organization whatever to protect or encourage the interests of the agricultural community.

In 1847, the government, realizing the great needs of the industry, introduced in the legislature the first bill concerning agriculture. By this law the formation of agricultural societies was authorized, the government agreeing to give subventions amounting to three times the amount subscribed by the members of these associations. This money was to be used as prizes at fairs or used for the importation of live stock and to purchase improved seeds. However, these associations, left to themselves and lacking experience and direction, did almost nothing.

Five years later (1852) a law was passed creating the Department of Agriculture, the Board of Agriculture, and authorizing the establishment of schools of agriculture and model farms. But the most useful

work of the Board of Agriculture (which became the Council of Agriculture in 1869), in addition to a few improvements from 1853 to 1880, was the encouragement given to the breeding of Ayrshire cattle and to the improvement of the breeds of pigs, (Dr. J. A. Couture, Quebec, 1908).

But, after all, if agriculture had not made very marked progress, work was going on preparatory to a more rapid progress which, for the last forty years, has not been checked and has taken, specially during the last few years, a magnificent development, in all the branches of farm husbandry.

TO-DAY

The province of Quebec now has a model agricultural organization and we are witnessing with confidence the development of the resources which Divine Providence has sown with such a lavish hand on our magnificent country, and which only requires the persevering efforts of our rural population to reach a full development.

VALUE OF THE FIELD CROPS OF THE PROVINCE FOR THE YEAR 1915

Wheat.....	\$ 1,891,000
Oats.....	23,200,000
Barley.....	1,939,000
Rye.....	162,000
Peas.....	998,000
Beans.....	327,000
Buckwheat.....	2,157,000
Mixed grains.....	2,188,000
Flax.....	15,000
Seed corn.....	569,000
Potatoes.....	9,631,000
Turnips, etc.....	1,132,000
Hay and clover.....	58,507,000
Fodder corn.....	1,872,000
Alfalfa.....	95,000

Total value of crops... \$104,683,000

This regeneration of agriculture in the province of Quebec, and the prosperity which it now enjoys, are due in a large measure to the development of the dairy industry.

The production of milk, which, in 1900, was valued at \$21,000,000,

amounted to \$31,000,000 in 1910 and had reached in 1915 an approximate value of \$35,000,000, or an increase of \$1,000,000 annually.

According to Mr. G. E. Marquis, chief of the Quebec Statistical Office, the creameries and cheese factories of the province manufactured in 1915, butter and cheese valued at \$17,302,400.

THE CLIMATE OF THE PROVINCE

Considering the climate and the length of the season, the province of Quebec may be divided into three districts: one extending from Gaspé to Rimouski, another one from Rimouski to Three Rivers and the third from Three Rivers, towards the West, to the frontiers of the province in the county of Soulanges. The first district has a very damp climate owing to its proximity to the Atlantic Ocean and the temperature varies between 30 and 80 degrees F. The land can be worked only from the 20th of May to the 15th of October (about five months). In the second district the season is much longer (six months) and the temperature varies from 30 to 90 degrees F. The third district has the largest variation of temperature (27 to 93 degrees F.), and the longest season of cultivation, from April 20th to November 20th (seven months).

The rigour of the Canadian climate is no obstacle to the growing of grain, fodder plants, roots and fruit; quite the contrary. The province of Que-

bec has an exceptional productivity; breeding operations are in no wise hindered by the snow; the cattle have a remarkable strength, which, to a great extent, wards off contagious diseases. Snow gives the land an absolute rest; in the spring, water from the melting snows permeates the soil and prepares it for a rapid and healthy growth.

CONCLUSION

It has been said that this province is the country of milk, sugar (maple sugar) and honey; to this may be added the fact that the soil and climate are also favourable for the breeding of all farm live stock (cattle, sheep, pigs, fowls, etc.), for which almost unlimited markets are open. From this point of view, the province of Quebec possesses immense resources still undeveloped.

Our rural population, intelligent and active, helped and encouraged by the efforts of the provincial Department of Agriculture, progresses continuously and brilliant prosperity may be hoped for.

N.B.—In the preparation of these notes, I consulted the works of several competent authors such as those of the Rev. Ivanhoe Caron, Agricultural Missionary, Mr. G. E. Marquis, chief of the Quebec Statistical Office, and specially the "Three Centuries of Agriculture" (published in one of the volumes of "Canada and its provinces") by Mr. J. C. Chapais, Assistant Dairy Commissioner.

"Extravagance, always a folly, in these days becomes a crime; thrift, always a virtue, in these days becomes a national duty."

RURAL HIGHWAYS

While every province in Canada has provision for the construction and maintenance of rural roads, the policies of the several provinces are by no means uniform. Because of the importance of good roads to agriculture, and the development of a desirable community spirit, there has been here brought together statements, prepared by the chief road officials of the various provinces, outlining the policies pursued and setting forth the legislation under which the roads are maintained and the organization for carrying on the work.

PRINCE EDWARD ISLAND

BY L. B. MCMILLAN, SECRETARY OF PUBLIC WORKS

BY the Road Act of 1912 each of the 470 school districts in the province was constituted a road district with an average road mileage of 7.6.

The roads in each district are looked after by a road-master appointed by the Lieutenant-Governor in Council. On or about the 15th of March, each road-master makes out a list of all persons within the district liable to pay road tax, setting forth the amount payable by each, and about the 1st of April serves each person with a notice of his liability, which person can, within a week, elect to commute the payment of same by rendering personal service, or service by a substitute, or to pay cash.

The tax consists of \$1.50 levied on each person between the ages of 21 and 65, also 40c. for each horse owned over three years of age, \$1 for each dog, and \$3 for each bitch.

For labour in commutation of tax a man is allowed \$1.50 per day and for a horse 75c.

Those wishing to perform statute labour are summoned by the road-master on 24 hours' notice to meet him and to work upon the highways and bridges at such different days, and in such groups as he may think proper, subject, however, to the approval of the Commissioner of Public Works.

A full return of all taxes levied, received and expended, is made by the

road-master to the Commissioner of Public Works, and also a report on the condition and requirements of the roads and bridges within his district, and an estimate of cost of repairs and improvements, and of the taxes for the ensuing year.

Emergency repairs needed in any district are reported at once to the Commissioner of Public Works by the road-master. If considered necessary, the place is visited by the engineer, who advises and specifies as to work requiring to be done, which work is usually sold by public auction to the lowest bidder, but may be done by day labour. The building of bridges and new roads, and the carrying on of larger improvements on the roads, is done directly by the Commissioner of Public Works, on the recommendation of the provincial engineer, the cost being a charge on the provincial revenue. The road tax is only about sufficient for road maintenance such as can be accomplished by road machines and road drags. These machines are supplied by the Department to the road-masters, who furnish the men and horses necessary for their working.

The policy of the Government has been to rebuild bridges with permanent structures of steel or concrete, and to replace the small wooden culverts with concrete pipe. An approximate estimate of the proportionate number of bridges and cul-

verts thus permanently built would be about 10 per cent.

In the way of improved roads, attention is being given to the building up and draining of low roads, to the improvement of grades on hills by cutting down or opening roads

around, and all with a view to afford a foundation for the harder wearing surface which will eventually come. The expenditure for the year 1915 was \$36,000 from road tax, and from provincial revenue on roads \$33,500 and on bridges \$53,000.

NOVA SCOTIA

BY W. G. YORSTON, C.E., ASSISTANT ROAD COMMISSIONER

THE principle at the basis of all the early road legislation in this Province was that the laying out and maintenance of the highways was a municipal affair. The roads were laid out under commissioners appointed by the county councils, and maintained by statute labour. Although the later Acts have placed the subject matter of roads to a large extent under the control of a Provincial Department, the idea of municipal maintenance by statute labour has not been entirely abandoned. Under the legislation at present in force (Acts 1907, Chapter 2) an official of the Department of Public Works and Mines, called the Road Commissioner, has general supervision over the building and maintenance of roads and bridges. He controls the expenditure of all road moneys appropriated by the Provincial Legislature. In each municipality, inspectors of roads and bridges are appointed by the Lieutenant-Governor in Council, on the recommendation of the Road Commissioner. It is the duty of each of these municipal inspectors to report to the commissioner as to the condition and requirements of the roads within his territory, and to make estimates of the cost of proposed or necessary improvements. Every inspector also divides the municipality under his charge into road districts, and appoints road-masters for each district. These road districts for the most part correspond with the polling divi-

sions. It is the duty of every road-master to report to the inspector as to the requirements, and to direct and supervise the expenditure on the roads within his district.

In addition to such sums as may be appropriated by the Legislature for road expenditure, there is also legislation (Acts 1908, Chapter 4) under which a poll tax is payable by all residents of the municipality.



LAYING BOTTOM COURSE FOR MACADAM
Clarence Road, Annapolis County, N.S.

It is also provided by such legislation, that all property within the municipality shall be rated for the maintenance of the roads within the road section in which the owner of the property resides. The boundaries of the road sections within each municipality are fixed by the

municipal council. The fund raised by these methods (that is the poll tax and the municipal road tax) is administered by officials appointed by the municipal council, called, surveyors of highways. One such

administration of the road funds is sought by providing that the road-masters appointed by the provincial inspectors, may be the same persons as are appointed surveyors by the municipal councils.



PLACING SCREENINGS FOR MACADAM ROAD
Clarence Road, Annapolis County, N.S.

surveyor is appointed for each road section, whose duty it is to collect the municipal road taxes and expend the same "in a judicious and economical manner", and to superintend the sectional work performed on the roads. Some unity in the

The tendency of later legislation has been towards bringing the expenditure on the roads under provincial administration. The Legislature in 1912 and 1913 provided a sum of \$600,000 for smaller bridges and culverts to be built of permanent



FINISHED MACADAM ROAD
Clarence Road, Annapolis County, N.S.

material, also in 1913, provision was made that an allotment of \$10,000 in each of the eighteen counties of the Province, should be expended for improvement on main through highways and important laterals, and also that the annual fees received for the registration of motor cars should be expended in road improvement. There had been expended to the close of the year 1915, \$154,000, and of the fees received for the registration of motor cars, \$19,000.

The policy adopted by this province may be briefly stated to be, first, to build the larger bridges of

smaller bridges of permanent material, upon the roads subject to the greatest travel, and to this end instrumental surveys were made and the structures located to the best advantage, in respect to satisfactory side drainage. In connection with these structures, generally built by contract, some of the side ditching was included. The good material of the side drainage is placed on the roadbed, shaped to proper form and surfaced where most required with gravel or broken stone. The expenditure for this class of work to the end of the cal-



IMPROVED GRAVEL ROAD IN HANTS COUNTY, N.S.

permanent material, and, as the population is largely around or near the shore, it follows that the bridges are near the mouths of the rivers, and generally of considerable length and comparatively expensive.

Up to the end of the calendar year 1915, the sum of \$3,400,000, in round numbers, had been spent upon the construction of 1238 larger bridges, of which 760 are of steel and iron, resting on masonry or concrete substructures. The next step undertaken and now in progress, was to construct the culverts and

endar year was \$503,000, and upwards of 2,000 miles had been provided with this class of structures. The next step will be the perfecting of the drainage—both as regards side ditching and the form of the roadbed—surfacing, and the abolition of narrow tires. No macadam roads are in contemplation. At present it is believed to be more economical to make good dirt roads, keep them in good repair, and eventually, as travel increases and financial conditions warrant, to proceed with more perfect surfacing.

There is the equivalent of 46 inches of rain fall during the year, mostly in the early spring and late autumn. The frequent thaws and freshets during the winter months cause the destruction of the roadbed

and structures, and, owing to climatic conditions existing in the province, the maintenance of roads is a matter requiring a large expenditure per mile, and constant care and attention.

NEW BRUNSWICK

BY JOHN L. FEENEY, PROVINCIAL ROAD ENGINEER

THE Minister of Public Works is the head of the Highway Department of this Province, but the highway authority is the Provincial Road Engineer, who holds office during the pleasure of the Lieutenant-Governor in Council. This official has supervision and general control over the construction, maintenance and repair of the highways of the province and of all bridges under twenty span.

The organization under the control of the Road Engineer consists of an Inspector of Roads in each county where necessary, and at least one Road Supervisor for each parish of that county. A parish is often divided into districts and a supervisor placed in charge of each district when the mileage and disposition of the road warrant same. These supervisors are appointed by the Department head, and they in turn may appoint road-masters or foremen under them, if necessary.

At the present time there is no general construction programme along permanent lines in vogue, though small sections of permanent roads have been built in various parts of the province. The roads funds have been, in the past, devoted to the maintenance of existing roads, to the reconstruction of badly worn earth roads and to the construction of earth roads in new locations. The Department is at the present time paying particular attention to culvert construction and general drainage, and to the construction where practicable of good gravel roads.

There is no classification of roads, and the Government grants are expended as equitably as possible in the various counties. A road tax is annually levied for road purposes in each parish; every male person between the ages of twenty-one and sixty years, resident in the parish, pays a poll tax of one dollar and fifty cents, and an amount not less than one-fifth of one per cent is levied upon the assessed value of the real and personal property and income of every person, company and estate in the parish. Any municipality may increase this rate of road tax. These taxes are collected by the supervisors, transferred by them to the county treasurer, and are expended on the order of the Minister in the divisions in which said moneys are collected. Resident rate payers of any division may, however, perform labour in lieu of money payment before July 15th of each year. This system places the general control of the roads directly in the hands of the Government.

This province will, no doubt, undertake the construction of at least main roads on a permanent basis after the war in any counties willing to contribute a fair percentage of the cost. County roads also will be constructed to a better standard, but the Government will scarcely bear as great a percentage of cost of these as in the case of main roads. So also with the third class or the parish road, which would be given the smallest per cent subsidy of any class. Special care must then be taken that the cost of construction and main-

tenance is divided, and that taxes are assessed equitably. The first essential for a successful good roads' movement is in evidence in the pro-

vince in that the people seem disposed to render both moral and financial support, when our present critical task is finished.

QUEBEC

BY B. MICHAUD, DEPUTY MINISTER, DEPARTMENT OF ROADS

THERE was no organized system of road improvement in the province of Quebec until the Government took a hand. Systematic road improvement work had been undertaken only in one part of the province, the Eastern Townships, under the special provisions of the municipal code governing these districts. Under this code, the municipal councils were made responsible for the maintenance of highways and they had the work done by paid labour and by the "bee" system. In the remainder of the province the roads were, and are still, with the exception of those in some 500 municipalities, maintained under the "system of shares", that is, every man was responsible for the part of the road in front of his property. A change was necessary; both these systems had to be eliminated, the "bee system" particularly, being opposed to a sound municipal administration, even when the affairs are entirely in charge of the municipality. What was required was systematic work, under the direction of the municipal council, and paid in money by the council, by means of direct taxation.

It was not before 1907 that grants in aid of this system were made by the government. Before that time, the encouragement given to the improvement of highways had been rather limited and had taken other forms.

The following are mentioned from memory only:

In 1895, the sum of \$75 was spent as travelling expenses for a lecturer.

In 1897, the sum of \$5,953.34 was

expended in the purchase of machinery and on administrative work.

In 1898 agricultural appropriations contained a vote, which was applied in the following manner: in each county, three grants, \$125, \$100 and \$75 respectively, were given to the three first municipalities purchasing a repairing machine for earth roads. In addition, another grant amounting to \$1200 was offered to each county purchasing a stone crusher.

In 1907 a law providing for a sum of \$800 to be placed at the disposal of local municipalities that would put the improvement of their roads in charge of the municipal councils was adopted. This law, after being amended from year to year, became in 1911, Law I, Geo. V., ch. 21, since amended by 2 Geo. V. ch. 21 and 22, and by 4 Geo. V., ch. 18. It now constitutes the legislation under which the Minister of Roads may grant to rural or town municipalities, subventions for the macadamizing, gravelling or maintenance of highways, and it has been known under the name of "Law of 1911". These subventions are paid out of an appropriation of \$250,000 voted each year by the Legislature for road improvement.

LAW OF 1911

The characteristic features of this law are as follows:—

1. Maintenance: (a) Each rural municipality may obtain an annual grant of \$400 for the maintenance of all its highways, or a yearly subvention of \$200 for the maintenance of its side roads only. (b) Each town

municipality that places all its public roads in charge of its council may receive a yearly subvention amounting to 40 per cent of its expenses, provided this 40 per cent does not exceed \$200. If only the main highway is placed in charge of the council, the subvention at the same rate may not exceed \$100. (c) The two first municipalities in a county placing all their roads in charge of their council are entitled for two years to a subvention amounting to three-fourths of their expenses. The first municipality is entitled to a subvention of \$600 and the second to a subvention of \$500. If their regulations have been adopted at the same time, the subvention is \$500 for each one.

2. Macadamizing or gravelling:

(a) Each rural municipality may receive a grant of \$1000 a year, amounting to 50 per cent of its macadamizing expenditure. This grant is only \$500 if the roads are only gravelled. If both gravelling and macadamizing are done, the total amount of the grant may not exceed \$1000; each town municipality may receive a grant of \$1000 per year at the rate of 40 per cent for the macadamizing of its roads. If gravelling only is done, the subvention is \$500. If both are done, the total of the subvention may not exceed \$1000.

(c) A rural municipality that has had completely macadamized a road which traverses the whole length of the municipality district may receive, in addition to this grant of \$1000, an extra grant fixed by the Minister of Roads. (d) A rural or town municipality, not desiring to do macadamizing or gravelling at its own expense, may, nevertheless, pass a regulation stipulating that this work shall be done at the expense of certain tax payers, providing these tax payers present a petition to this effect signed by the majority. The majority is not necessary for gravelling work.

Grants for macadamizing or gravelling are paid in addition to the grants for maintenance, and each municipality may transfer to the

county council its rights to the subventions to which it is entitled under the law.

LAW OF 1912

The law of 1911 presented a serious objection. Under this law, the grant given by the Government is never increased, whatever may have been the amount spent yearly on macadamizing or gravelling. In some districts this system worked satisfactorily. People would rather pay at once what they have to pay and receive the grant to which they are entitled. In the majority of cases however, this system is not looked upon with favour; people hesitate about starting the work on account of the immediate and considerable outlay that is necessary. Realizing the situation, the Government adopted the Good Roads Law of 1912, by which it was authorized to borrow \$10,000,000. This amount was increased to \$15,000,000 during the session of 1915. By the original law of 1912, the Government was authorized to issue debentures signed by it and by the municipalities, the latter being called upon to pay only 2 per cent interest during 41 years, the Government paying the remainder of the interest and providing the sinking fund. The law such as amended today does not provide for borrowing by the municipalities. The Government does the borrowing itself by the issue of debentures. If, on account of the condition of the money market, the Government is not able to borrow, unused appropriations out of the ordinary revenue of the province may be spent on the improvement of roadways. Out of these sums or out of the loans, sufficient grants are allowed to the municipalities to enable them to pay the costs of their macadamizing or gravelling. The municipalities are called upon to pay only 2 per cent interest during forty-one years on such sums. The remainder of the interest and the sinking fund are paid by the Government.

Municipalities applying under the law of 1912 are not allowed to share at the same time in the benefit of the law of 1911, unless for the maintenance of their roads.

The granting and the paying of such subventions under the law of 1911 or of 1912 are subject to certain proceedings, which are made known to the municipalities when they apply to the Minister of Roads.

ROAD IMPROVEMENT

During the few years that the laws of 1911 and 1912 have been in operation the roads of the whole province of Quebec have been transformed.

Out of 45,000 miles of provincial roads, 20,000 miles are regularly and systematically maintained under the supervision of the Roads Department.

Since 1908, 557.15 miles of roads have been gravelled in the province. During the same lapse of time, 1205.65 miles have been macadamized.

Since 1908, about 12,000 culverts (under 8 feet arch) in concrete, iron, steel, or stone, have taken the place of the same number of wooden bridges.

Since 1912 the road Edward VII, between Montreal and the boundary near Rouse's Point, about 39 miles, was built by the Government. In 1913 the construction of the Montreal-Quebec road, on the north shore of the St. Lawrence, about 150 miles in length, was begun by the Government. This road, which will altogether change the conditions of traffic in the district which it traverses, will be finished this summer. The Levis-Jackman road, about 93 miles in length, will also be completed this summer by the Government. In 1915, the Sherbrooke-Derby road, 33 miles long, was completed. The Edward VII and Montreal-Quebec roads are built in macadam; in a few months from now the first will be covered with a coat of asphalt; the

Levis-Jackman and Sherbrook-Derby roads are in gravel with the exception of $6\frac{1}{3}$ miles on the Sherbrooke-Derby, which are in tarira macadam. In addition to the four provincial roads above mentioned, a plan for the construction of a road connecting Three Rivers and Grand Mère is actually under consideration.

Since 1912, about five hundred municipalities have asked to share in the advantages offered by the Government to macadamize or gravel their roads under the law of 1912.

The Roads Department owns 57 macadam apparatus, which are loaned to the municipalities according to the circumstances. The department also owns a number of other machines, such as rollers, tractors, road machines, cranes, scrapers, which are, at the present time, being used in the construction of the Levis-Jackman road.

In addition to the machines owned by the Government the municipalities own 143 complete sets of implements.

Each year the provincial parliament passes a vote "Improvement of Rural Roads", out of which subventions are granted for the maintenance, the macadamizing or gravelling of roads. This vote is generally \$250,000. Before the law of 1912 was passed it has been as large as \$350,000.

Since 1911 the provincial government has paid for the maintenance and improvement of earth roads and for the construction of macadam or gravel roads, the purchase of machinery and administration expenditure, a total of \$14,584,681.12.

The road improvement system of the province of Quebec presents two characteristic features: 1. Full autonomy is left to the municipal councils, these being free to accept or refuse the advantages that are offered to them. The objection might be raised that roads might be improved in a certain number of districts only, but this objection has been elimin-

ated by the construction of provincial roads.

2. It provides for the construction by the government of large arteries between the new centres, the effect

of which is to complete the improvements made by municipalities remote from each other and to create, in addition to local roads, long distance communication roads.

ONTARIO

BY W. A. MCLEAN, M. CAN. SOC. C.E., DEPUTY MINISTER, DEPARTMENT OF PUBLIC HIGHWAYS

THE management of country roads in the province of Ontario is in general vested in township councils; but county councils have authority to assume systems of leading roads which are subsidized by the province. The influence of a central authority is extended through a provincial Department of Public Highways.

The general trend of recent road legislation in Ontario has been toward a three-fold classification so desirable for distribution of the cost, and which is being evolved in the following manner:

1. Local or township roads, each carrying the traffic, or little more than the traffic, which is created by the farms adjoining the road; such roads to be controlled by and at the expense of township councils.

2. Leading market or county roads, the roads radiating from local market or shipping points, which carry a considerable accumulation of traffic; such roads to be controlled by and at the expense of county councils and cities, aided by a provincial subsidy.

3. Main roads between important cities and other terminal points and benefitting a series of municipalities; such roads to be controlled by local boards of trustees, and at the expense of all municipalities and property benefited, aided by a provincial subsidy.

DEPARTMENT OF PUBLIC HIGHWAYS

The Department of Public Highways is in charge of a Deputy Minister, Chief Engineer and staff. The duties of the department have a considerable range including:

The administration of the Highway Improvement and Ontario Highways Acts;

Administration of the Motor Vehicles Act;

Administration of the provisions of the Municipal Act with respect to plans and specifications for steel and concrete bridges;

Consultation with town, city and township councils with respect to road and street improvement;

The construction of model and experimental roads;

Educational measures such as the publication of reports and bulletins, addressing public meetings, and the instruction of county road superintendents;

Miscellaneous matters such as traffic census, the testing of road materials, road surveys and estimates.

MUNICIPAL ORGANIZATION

The care of roads constitutes one of the chief duties of township and county councils. Provision for municipal organization is made by the Municipal Act of the Province, which Act defines the general authority of municipal councils with respect to roads. Township councils usually consist of a reeve and four councillors. A county is formed of a group of townships, and the county council is composed of the Reeves (and deputy Reeves) of the townships, towns, and villages included within the area of the county.

TOWNSHIP ROADS

Township councils, in the earlier history of the Province, depended largely on statute labour for road improvement. Money expenditure, raised by a general levy on the township assessment, has been steadily increasing. At the present time townships are spending annually over \$1,400,000 in cash, and

1,100,000 days of statute labour, having a total estimated value of \$2,500,000 annually.

Township councils have authority to pass by-laws to abolish statute labour. About one-quarter of the townships have done so, while the number is steadily increasing.

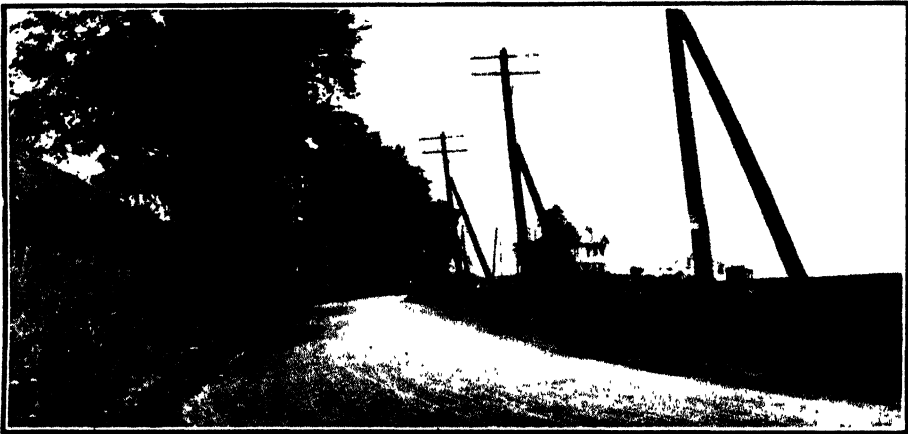
The Highways Department is encouraging all township councils to place their road expenditure in charge of a permanent road superintendent or foreman, and to this end will pay (under the Ontario Highways Act, 1915) one-quarter of the salary of such an official; the provincial grant not to exceed \$150 annually.

under this plan within a few years, and that the annual expenditure will be doubled. The chief features of this Act are as follows:—

A county council is authorized to assume by by-law a system of roads for construction and maintenance; the province contributing 40 per cent of the expenditure on construction and 20 per cent of the cost of maintenance.

The mileage of roads assumed by a county is usually from 12 to 18 per cent of the total road mileage of the county.

The direction and superintendence of the work is placed in charge of a county engineer or capable superintendent appointed by the county council. A committee of the county council should co-operate with, advise and direct the road superintendent.



A COUNTY ROAD SUBSIDIZED BY THE PROVINCE

COUNTY ROADS

Provincial aid to road construction is given principally through county road systems, under the Highway Improvement Act. Twenty counties out of the thirty-eight which are eligible are carrying on construction, having assumed 4,029 miles of road, of which 2,041 miles have been substantially built. Expenditure to the end of 1915 has amounted to \$6,000,000, including \$1,200,000 for bridges. Work is now being carried on at the rate of \$900,000 annually. It is anticipated that all counties will be operating

Roads are to be built in accordance with the regulations of the Department of Public Highways. The construction should be suited to local material and traffic. A standard type is regarded as a roadway well drained, graded to a width of 24 feet between ditches, with broken stone or gravel in the centre to a width of from 9 to 18 feet, and consolidated by rolling.

The provincial grant is paid annually, and is based on a statement of expenditure for the year, submitted to the Minister of Public Works and Highways by the county council, and includes all costs of labour, material, engineering services, salary of road superintendent, machinery, and bridges on the designated system of county roads.

The county council may finance their work by issuing debentures for a term not

exceeding thirty years; or by sums raised from year to year in the annual county rate.

SUBURBAN COUNTY ROADS

Provision is made under the Ontario Highways Act, that a city may co-operate with the county council in improving the leading county roads adjacent to the city, and thereby obtain a more substantial type of construction for such suburban roads.

For construction the Province contributes 40 per cent, and the county and city each pay 30 per cent; for maintenance and repair the province contributes 20 per cent and the

roads, the province contributing 40 per cent of the cost. A main road is interpreted as one running directly between two important terminal points or cities, and passing through a series of municipalities. Such series of municipalities may petition the province for its construction as a main road, and if the petition is endorsed by at least three-fourths of the municipalities affected, a board of trustees, representative of the municipalities affected, will be appointed by Order-in-Council to take charge of the work. The Highways Department will then make surveys and prepare plans, specifications and



FRONTENAC COUNTY ROADS SUBSIDIZED BY THE PROVINCE, PERTH ROAD, SOUTH OF INVERARY, PLAIN MACADAM

county and city divide the remainder equally between them.

The section of county road designated as "suburban" remains a county road for which the county is responsible; the work of construction and maintenance to be carried on under the county road superintendent, but subject to the instructions of the special commission.

MAIN ROADS

The Ontario Highways Act provides for the construction of main

estimates. The remainder of the cost (60 per cent) is apportioned by the engineer's report among the municipalities and property benefited.

Among the objects of the law respecting main roads, as contrasted with county road organization, are that the construction of a road between important terminal points may be undertaken as one work irrespective of county boundaries; that cities may thus be required to contribute more equitably to the cost; and that a more suitable type of construction may thereby be obtained.

The Toronto-Hamilton Highway, an expensive work, is being built under a special Act, somewhat similar to the provision for main roads, but the commission in charge having more extensive powers.

MOTOR VEHICLES ACT

The administration of the Motor Vehicles Act is vested in the Department of Public Highways. All motor vehicles and chauffeurs are licensed by the Department. Under a newly revised schedule of fees it is

sufficiently signed, the council may undertake the work, first obtaining the report of the engineer and holding a Court of Revision at which his assessment is considered, revised and confirmed. This Act, as previously suggested, has been framed more especially for cities and towns in the construction of streets, sewers and similar improvements, and has been employed to a limited extent only for country roads. A Bill is now under consideration more especially applicable to country roads, which



ON THE NEW TORONTO-HAMILTON HIGHWAY, CONCRETE 18 FEET IN WIDTH
WITH EARTH SHOULDERS 4 FEET WIDE ON EACH SIDE

anticipated that the income from this source for 1916 will be \$500,000.

LOCAL IMPROVEMENT ACT

The Local Improvement Act, while used almost exclusively by towns and cities, is occasionally applied to roads in the rural districts. The cost is distributed on property benefited according to frontage. Under this Act residents on a street or road may petition for construction; and if the petition is

will include the principle of levying the cost according to benefit, but which in procedure will, it is anticipated, be more applicable to the improvement of township and county roads. The use of the Local Improvement Act or the proposed Act for township roads, would be optional with the municipality.

COUNTY AND TOWNSHIP BRIDGES

The Municipal Act requires that all county bridges, and all township

bridges over twenty feet in span, shall be constructed in accordance with the general specifications of the Department of Public Highways. The purchase of bridges and their inspection are functions of all municipal councils; but councils purchasing bridges may submit their plans to the Department of Public Highways for certificate as to design under the general specifications.

LOAD OF VEHICLES

An Act of the Province restricts the load carried by any vehicles to 12 tons, not more than $4\frac{1}{2}$ tons to be on one wheel; the width of tire to be not less than one inch for each 650

township organization exists, the Province may make special grants to townships equal to a sum set apart by township by-law for the construction or improvement of specified roads. The Provincial Government also makes annual appropriations for the opening and improving of roads in any part of Northern Ontario, which are expended by the Colonization Road Branch through foremen and inspectors appointed by the branch; which branch is under the Department of Public Works.

A considerable expenditure has also been made on trunk roads in Northern Ontario from a special appropriation of \$5,000,000; this work being carried on under the Northern De-



A MACADAM ROAD NEAR TORONTO, PROTECTED FROM TRAFFIC
AND MADE DUSTLESS BY TARRING

pounds carried by the wheel. The speed of a motor truck weighing with its load in excess of four tons is restricted to ten miles an hour; and trucks exceeding six tons are restricted to six miles an hour when equipped with steel tires, and to eight miles an hour if equipped with rubber tires.

NORTHERN ONTARIO

The roads of Northern Ontario have been largely created under colonization road appropriations and the Colonization Road Act. Under the Colonization Road Act, wherever

development Branch, in the Department of the Prime Minister.

HIGHWAY STATUTES

The more important statutes of the province relating to highways are as follows:—

Highway Section of the Municipal Act; The Local Improvement Act; The Statute Labour Act; The Highway Improvement Act; The Colonization Roads Act; The Highway Travel Act; The Motor Vehicles Act; The Snow Roads Act; The Toll Road Expropriation Act; The Toll Roads Act; The Snow Fences Act; The Traction Engines Act; The Tree Planting Act, and The Load of Vehicles Act.

MANITOBA

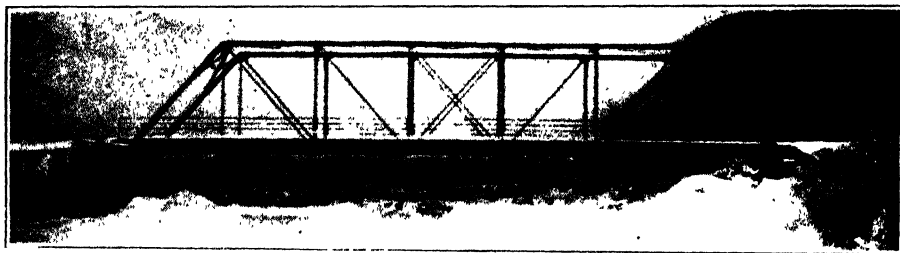
BY A. MCGILLIVRAY, HIGHWAY COMMISSIONER

THE construction and upkeep of the roads of this Province are under the jurisdiction of the municipal councils. The council of a municipality may levy under the Municipal Act an annual rate, not exceeding 20 mills on the dollar, for the purpose of carrying on the general affairs of the municipality, including the building and maintaining of roads and bridges.

The Legislature in 1914 placed on the statutes of the Province "the Good Roads Act, 1914" whereby Government financial assistance may

each municipality a system of well-constructed main lines.

The Act is applicable also to the construction of roads which, while of local benefit, may be considered to be of more general importance in forming parts of a transprovincial highway. Towards the construction of such a road the Government financial assistance under the Act may be of greater proportion than on local main roads. It is thought that in building a continuous road,—in many places through undeveloped territory, the municipality would be con-



ONE HUNDRED AND TWENTY-NINE FOOT TRUSS OVER THE SWAN RIVER, MANITOBA

be given rural municipalities in improving their main roads and bridges. The sum of \$2,500,000 was voted by parliament for carrying out the object of the Act.

PURPOSE OF THE ACT

The object sought by this legislation is the establishing, under Government supervision and financial assistance, of well-constructed roads in the rural municipalities suitable to the local requirements and conditions obtaining therein.

There are in all municipalities roads of outstanding importance, being subjected to a greater amount of traffic than others and which may well be designated "main roads." It is to these roads that the attention of municipal councils is especially directed with the view of securing in

tributing on portions thereof which would be but little local benefit, hence the greater Government assistance thereto. However, the building of such provincial highways is, as yet, considered by many as of secondary importance compared with the improvement of local requirements in the municipality.

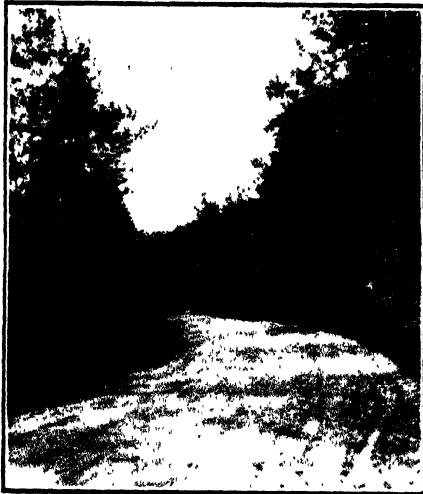
THE GOOD ROADS BOARD

The Act is administered under the Department of Public Works, through a Good Roads Board, consisting of three members and of which the Highway Commissioner is chairman. The duties of the board are to carry out the provisions of the Act, investigate and determine upon the most suitable methods of road construction and maintenance best adapted to the various sections of the

province, and to assist and co-operate with municipal representatives in formulating adequate systems of roads in their respective municipalities.

APPLICATION FOR ASSISTANCE BY MUNICIPALITY

Applications from the municipal councils for assistance under the Act are directed to the good roads board. The proposal of the council is investigated by the board, assisted by its engineers, and its recommendation thereon made through the Minister of Public Works to the Lieutenant-Governor in Council for approval,



IMPROVED ROADWAY, BIRDTAIL HILL,
BIRTLE, MANITOBA

which approval if obtained is given by Order-in-Council and the municipal council thereby authorized to proceed with the work.

METHOD OF FINANCING ROAD IMPROVEMENTS

A municipal council building a road or system of roads under the Act may procure the funds for so doing by any of the three following methods, viz.:—

1. By the issue and sale of debentures. Such debentures being for a term not

exceeding thirty (30) years shall bear interest at a rate not exceeding six (6) per cent. The total amount of debentures which a municipality may issue under the Act must not exceed six (6) per cent of the total assessed valuation of all real property in the municipality subject and liable to taxation and as shown on the revised assessment roll of the municipality. A municipal debenture by-law requires the approval of a majority of the rate-payers of the municipality, or portion thereof affected, who have voted upon such by-law.

2. By a special annual rate not exceeding five (5) mills on the dollar, which may be levied against the whole or any portion of a municipality benefited.
3. By apportioning a proportionate share of available municipal funds for the use and benefit of any portion of the municipality, which in the opinion of the council is specially benefited by the work.

PERFORMANCE OF WORKS

All works to be performed under the Act are let by contract by the municipal council, subject to the approval of the Good Roads Board, unless it is mutually determined by the council and the board that it can otherwise be performed to better advantage. The works must be carried out in accordance with plans and specifications of the board and at all times under the general supervision of an engineer of the board.

GOVERNMENT FINANCIAL ASSISTANCE

When any works have been undertaken by a municipality under the Act, the council, during the progress and upon the completion of such works, shall transmit to the board a statement setting forth the expenditures to date in carrying out the same, together with a statutory declaration of the treasurer of the municipality that such statement is correct, and upon such statement being verified by an engineer of the board, and certified by him that the works have been performed according to plans and specifications, and the contracts in that behalf, the

Minister may, upon receiving said statement duly certified to by the board, direct the payment to the municipality of the following proportions respectively of said expenditure:—

1. In case of works, other than earth roads but inclusive of bridges and culverts (if such are of a permanent character) a sum equal to one-half ($\frac{1}{2}$) of the amount of all expenditures shown as aforesaid.

MAINTENANCE OF WORKS

The cost of maintaining the works performed under the provisions of this Act in a state of good repair is borne by the municipality exclusively, and paid for out of the general funds raised annually for the ordinary purposes of the municipality, and not out of the moneys raised by debentures under the Act for the purpose of construction.



IMPROVED GRAVEL ROAD, MUNICIPALITY OF ST. PAUL, MANITOBA

2. In case of earth roads, a sum equal to one-third ($\frac{1}{3}$) of the cost thereof, including bridges and culverts, and if such bridges and culverts be of a permanent character, the amount of aid may be increased to one-half ($\frac{1}{2}$) the cost of said bridges and culverts.
3. In case of roads forming part of a system of provincial highways, two thirds ($\frac{2}{3}$) of the cost of construction thereof.

If a municipal council fail to keep in good repair any roads constructed under the Act, the municipal commissioner may cause such maintenance work to be performed, and may collect the expense thereof from such municipality by levies made from time to time in accordance with "The Municipal Commissioner's Act".

SASKATCHEWAN

BY H. S. CARPENTER, ACTING CHAIRMAN, BOARD OF HIGHWAY COMMISSIONERS

THE highway construction work in this province, outside of cities, towns and villages, which look after necessary work on their own streets, is carried on under two organizations, first, by the Pro-

vincial Government and, second, by the councils of rural municipalities. The work carried on by the Provincial Government consists of the construction of timber bridges, steel bridges on concrete foundations, the

operation of ferries, and road construction and maintenance. The Government limits its highway work to trunk roads and main market roads. This highway construction work is carried on by the Government and under the control of the Chairman of the Board of Highway Commissioners, the entire cost being met by the Government. The bridge work is generally done

by contract. Expenditures are made from capital account on all work of a permanent nature and from income account for work of a temporary nature, such as maintenance and repairs.

The following amounts were voted by the Provincial Legislature for road work for the year ending April 30th, 1915, and for the year ending April 30th, 1916:

	1915	1916
For steel bridges on concrete foundations	\$300,000	\$100,000
Construction and improvement of public highways	1,200,000	200,000
	<hr/> \$1,500,000	<hr/> \$300,000
The amount voted by the Legislature, chargeable to income:—		
Roads and bridges	\$500,000	\$216,000
Ferry accommodation	90,000	90,000
	<hr/> \$590,000	<hr/> \$306,000

The amounts voted for the year 1915 were about on the same scale as those voted in the years 1912, 1913 and 1914. In 1915, however, owing to conditions incidental to the European war, we did not spend more than about one-third of the amount voted and for the current year, 1916, the vote has been cut down very considerably.

The rural municipalities work in co-operation with the Provincial Government on the construction of main market roads, but also find it necessary to spend a large amount of their funds on minor roads and for maintenance and repairs. The rural municipalities secure their funds from current taxes and considerable has also been raised to be expended on permanent improvements, from the sale of debentures. There are about 300 rural municipalities now organized and a municipality generally is 18 miles square, containing nine townships. The tax rate in the municipalities is not to exceed 10 mills on the dollar, and practically all of this money, except a small amount required for administration, is devoted to highway improvement. The rural municipalities expended on public works in the year ending April 30th, 1914, about \$1,975,000.

During the year 1913 and for three or four years previous to this date, we had a system of assistance or grants to rural municipalities for highway work. This system of grants, however, was discontinued in 1914. The main object in giving these grants was to give the Highway Commission the opportunity of exercising some authority over expenditures in rural municipalities and to get in touch with them so as to be able to advise them. This purpose has to a certain extent been accomplished, as shown by the marked improvement in the work of the rural municipalities, but it was found that there was a tendency in some municipalities, in order to take full advantage of the Government grants, to embark on an expenditure beyond what they could finance, with the result that some of them were led into financial difficulties. For this reason and for the reason that it was found very difficult to administer satisfactorily, principally because of the difficulty in having the municipal officials make proper returns, the system of grants was discontinued.

An Act respecting public highways was passed at the recent session of the Legislature. This Act became operative on May 1st, 1916.

ALBERTA AND BRITISH COLUMBIA

DEALING with the subject of rural highways in the *Canada Monthly* for May, Mr. E. A. Hughes gives the following facts with respect to the good roads movement in Alberta and British Columbia:

"In Alberta, provincial organization has been responsible for raising the appropriation from nothing, a decade ago, to one million dollars last year. This was for main and trunk roads. Municipal ex-

penditure was, in 1913, \$681,000; in 1914, \$865,190; last year it was nearly \$900,000. The Government work is under the Provincial Engineer of Highways".

"In British Columbia, under the Provincial Department of Public Works, the movement has made great progress. In 1901, estimates for roads and bridges totalled \$344,000; last year they totalled \$2,459,000. In 1910, a special programme provided that no less than twenty million dollars should be spent, chiefly upon main roads."

ROAD DRAG COMPETITIONS

MANITOBA

THE split-log drag competitions that have been carried on under the auspices of the Manitoba Good Roads Association have proved a great success, getting larger each year since their inception in 1910; in fact, they became almost too large for the association to handle, the distance to be covered in judging being the chief difficulty. In view of this, the association endeavoured to have good roads districts formed in other parts of the province. Two of these districts were formed last year, namely, the Red River Valley Good Roads Association and the Dauphin Good Roads Association, with Emerson and Dauphin respectively as centres. It is the desire of the association to have additional districts formed this year and its ultimate object is to have such districts covering the whole province. The Provincial Government of Manitoba is assisting the association in this respect, and has signified its intention to appoint an organizer and demonstrator of the split-log drag, also to make a grant of \$2.50 per mile for each mile of road entered and maintained in these competitions. It is also the intention to prolong said competi-

tions for the whole season instead of from two to three months in the year as heretofore.

RECOMMENDED BY UNION OF MUNICIPALITIES

Following is a copy of a resolution approved by the Minister of Public Works and by the Manitoba Good Roads Association and adopted at the twelfth annual convention of the Union of Manitoba Municipalities, held at the town of Stonewall, Man., November 23 to 25, 1915:

That the following be recommended by the Union to the Provincial Government:—

1. The appointment of an organizer for dragging competition districts.
2. The appointment of an instructor or supervisor for drags.
3. The making of a statutory grant to any associations under whose auspices competitions are carried out, up to half the amount given by them for prizes.
4. That the dragging be for the entire season, not for a short period in the summer as heretofore.
5. That a district might well include several municipalities.
6. That no roads be eligible for entry unless graded and at least 16 feet wide and that main roads should be preferred.

7. That the judging be provided for by districts themselves with the co-operation of the Good Roads Board.
8. That the organizer would not be needed to be employed for more than two months in the year, and the supervisor and instructor for one month.

The details of this resolution met with the approval of the provincial Department of Public Works with the exception of the suggestion as to a grant, which was changed as above stated.

METHODS OF COMPETITIONS

The number of competitors in the 1915 competition of the association was 48, and the number of miles maintained, 84. The competitions are financed by the association and the municipalities that enter. Several publications have been issued to mayors, reeves, township clerks and other municipal officials, as to the use and construction of the Split-log drag with diagrams and illustrations, methods of conducting competitions, manner of scoring, etc. Two species of classes are included in the competitions, one a gravel class and the other an earth class. The prizes usually run \$50 to first, \$30 to second, \$20 to third and \$10 to fourth. In addition there are invariably several special prizes forthcoming. The 1915 judges said that they found the task of making the awards extremely difficult owing to the many finely kept roads under competition, and in several cases special trips, after the final inspection, were made to thoroughly satisfy themselves as to the merits of the pieces under consideration. A great improvement was observed in roads contiguous to the city and the improvement was not altogether confined to the roads in the contest.

THE TIME REQUIRED

In an endeavour to ascertain how much time is necessary to keep a

piece of road in condition with a split-log drag, time cards were furnished each contestant, 43 out of 48 of which were returned. These show that an average of 32 hours was spent on dragging each piece of road last year. There cannot of course, be any specified time set for dragging, as it must be done, to obtain the best results, at the proper time, but taking one year with another the number of hours mentioned would appear a fair average for the two months' work.

A DEMONSTRATOR NEEDED

It was found that many of the contestants were not using a properly constructed drag, nor did they seem familiar with the correct use of the same. In a few municipalities some of the roads were dragged too much to the centre, forming too high a crown, although in other respects the roads were in good condition. Without a suitable drag and a knowledge of its proper use, unsatisfactory results are obtained which are discouraging and tend to lessen the user's faith in the efficiency of this splendid road implement. It was also found that in some districts culverts were not looked after as they should be, some not properly banked up, some too high and others too short, making roads dangerous to traffic, especially at intersections. In view of these conditions the judges suggested that beneficial results would accrue from the appointment of a demonstrator of the drag, who would visit the different parts of the province to instruct as to its most efficient use, which demonstrator could also point out the matter of culverts, cutting weeds and other details necessary for the making of a well-kept and tidy looking highway.

SASKATCHEWAN

BY H. S. CARPENTER, ACTING CHAIRMAN OF THE BOARD OF HIGHWAY COMMISSIONERS

FOUR years ago Saskatchewan introduced a "good roads policy" with the announced intention of spending \$5,000,000 to improve the public highways throughout the province. The work began in 1912, and the province has since expended \$7,000,000 through its Board of Highway Commissioners.

The Board soon realised that construction of roads, while an important step, is not of greater im-

effective in promoting the use of the drag, a circular letter was sent out early last spring to every municipality with a request for information as to the number of drags owned, and the use that was being made of them. The result was most surprising and showed that the number of drags had multiplied many times since the Highway Commission started the competitions. In 1912, there were 115 drags in the province,



TYPE OF ROAD DRAG USED IN SASKATCHEWAN

In Road Drag Competitions the operator herewith shown won first prize in District No. 2, and second grand prize in 1915.

portance than the maintenance of public highways in first class condition. Consequently, "road drag competitions" were introduced and have contributed in a large measure to the improved conditions of Saskatchewan country roads. In the three years in which they have been carried on, 163 entries have been made in the competitions. Four hundred and forty-five miles of road have been examined time and again by the judges, and over ten thousand dollars have been paid in prizes.

To determine to what extent the previous competitions had been

which number had increased to 961 in 1915. One question elicited the fact that nearly 2,300 miles of road were dragged in the province during 1914, at an average cost of \$6.28 per mile. One hundred and seventy-five answers were very favourable as to road drags and dragging. Eighty answers did not express an opinion because drags had not been tried in the respective municipalities; 11 asked for information re drags, and only one secretary out of the 267 that answered was of the opinion that drags and dragging did not pay. No doubt this man expressed his

honest opinion, but it is a question whether he really knows what a road drag is, or what it is used for.

The following circular has been issued outlining the rules for 1916 competitions:—

RULES GOVERNING THE ROAD DRAG COMPETITION, 1916

1. The competition is open only to the councils of organized rural municipalities. Entrants will be grouped together in such manner as to form districts with from ten to twelve competitors each. Dragging will start on May 15th and end on September 15th.

2. Only one entry will be allowed from each municipality.

3. The road to be entered must be at least two and no more than six miles long.

4. Entries will be received up to and including May 15th, and no entry will be considered if it is mailed later than May 15th.

5. Any road which was entered in one of the former competitions will not be accepted for entry this year.

6. Roads entered in the competition must be a continuous grade. New roads to be built this year will not be accepted for entry. Roads graded in former years may be regraded and will then be eligible for entry, but such regrading must be finished prior to May 15th.

7. Every municipality entering the competition is required to put a sign on each end of the road bearing the following legend: "This road is entered in the 1916 Road Drag Competition."

8. The competing roads must be kept clear of weeds and all manner of growth from ditch to ditch.

9. Returns on forms to be furnished by the Highway Commission must be made regularly every month, and not later than on the date printed at the bottom of the form. They must be filled in complete by both operator and secretary. If returns are withheld until the end of the competition and then sent in a bunch, or if no returns at

all are sent, the municipality which in such manner disregards this rule will be disqualified thereby.

10. The prizes to be awarded in each district will be as follows: First prize, \$150; second prize, \$125; third prize, \$100; fourth prize, \$75; fifth prize, \$50.

11. The roads of the first prize winners in all the districts will be inspected again after the regular prizes have been awarded, and of these roads the one that is adjudged best will receive a grand prize of \$250, and the second best a grand prize of \$150.

12. All the above prizes will be paid in the following proportion: 75 per cent to the municipality winning a prize and the remaining 25 per cent to the winning operator. This applies to both regular and grand prizes.

13. The competitive roads will be inspected from time to time during the season, and the condition of the road at the time of entering, the character of the soil, the amount of traffic and other general conditions affecting it, and the state of the road during the season and when the competition closes, will be taken into consideration in awarding the prizes.

14. The judging will be done by points and the awards of the prizes will be made by disinterested judges appointed by the Board, the decision of the said judges being final.

15. Roads will be judged along the following lines:—

Beginning of season—

1. Condition of road before dragging starts.
2. Nature and formation of soil.
3. Length of road.

During season—

4. Improvement on road in (a) crown, (b) hardness, (c) smoothness.
5. Condition of ditches.
6. Freedom from weeds.
7. Amount of traffic.
8. General appearance.

End of season—

9. Value of returns.

16. No withdrawal of a road will be accepted after May 15th.

Thrift will help us to win the war, and the lessons we are receiving in thrift will do us no harm when the war is over. But there must be thrift all round. Thrift means a system under which all can thrive—not a system of senseless luxury and ostentation for some, and of grinding poverty and hardship for others.—*Agricultural War Book, 1916.*

GRANTS TO LIVE STOCK AND POULTRY ORGANIZATIONS

There is a decided divergence of policy throughout Canada with respect to provincial grants to live stock and poultry associations. The following statements show what each province is doing in this respect:

PRINCE EDWARD ISLAND

BY THEODORE ROSS, B.A., SECRETARY FOR AGRICULTURE

THE Provincial Department of Agriculture assists the Live Stock Association by carrying an advertisement of the pure bred live stock offered for sale in six different Island papers, the cost of which is about \$275.64 per annum.

Besides this a record is kept in the office of the pure-bred stock that is offered for sale and also of the names and addresses of men who wish to purchase. Lists are prepared and sent out monthly to the secretaries of the agricultural associations of Prince Edward Island, Nova Scotia and New Brunswick, and to any others who may apply. In this way the man who wishes to purchase is put in touch with the man who wishes to sell. The live stock breeders appreciate this and patronize the system to a large extent.

The Horse Breeders' Association has been holding an annual show. It receives the moneys collected for stallion enrolment and the Department of Agriculture supplies any further money needed. The total expenses including prizes for the horse show last year were \$566.25. The Department of Agriculture

provides a secretary and pays all the expenses connected with the enrolment.

The Department of Agriculture assists the Sheep Breeders' Association by contributing dollar for dollar for all the dues paid by the members by way of insurance against losses from dogs. The Department provides a secretary and pays all the expenses in connection with the insurance.

The Department of Agriculture co-operates with the representatives of the Poultry Division of the Live Stock Branch of the Federal Department of Agriculture in looking after the poultry interests of the Province, and contributes through him, financial assistance.

The Department also assists the live stock interests of the Province by contributing through the farmers' institutes for the purchase of pure-bred stock. Any institute may receive from the Department of Agriculture, an equal amount to that contributed by the members up to \$30. Thirty-five institutes took advantage of this last year and the Department contributions amounted to \$1,050.

NOVA SCOTIA

BY M. CUMMING, B.A., B.S.A., SECRETARY FOR AGRICULTURE

THE following grants are given to Live Stock Associations in the province:

1. The sum of \$15,000 is divided among

the various agricultural societies in the province (247). This amount is used by the agricultural societies to supplement the subscriptions of their members for the purchase of pure-bred live stock.

2. The Government gives \$1,200 a year to the Maritime Stock Breeders' association with which to conduct a winter fair at Amherst. This association also receives grants from the Governments of the other two Maritime Provinces and from the Federal Government.

3. The Government provides for a grant, not exceeding \$100 in one county, to poultry clubs in each county in the province. If there is a single club in a county it can receive the full \$100; if there are two or more, the amount must be divided among

them. In addition, provision is made for meeting the expenses of delegates from each of the poultry clubs in the province to their annual convention.

There are no other grants given directly to any live stock association as such, unless you include the grants which go to exhibition commissions, provincial and county, a large proportion of whose money is paid for live stock improvement.

NEW BRUNSWICK

BY J. B. DAGGETT, SECRETARY FOR AGRICULTURE

THE following regulations govern the bonusing of pure-bred cattle in this province. We have no regular live stock associations but assist agricultural associations as here outlined:

REGULATIONS GOVERNING THE BONUS- ING OF PURE-BRED CATTLE

(1) The stock shall be bought and sold under the direction of an agricultural society.

(2) Societies shall notify the Department before purchasing animals in order to receive the bonus on such stock.

(3) Animals shall be bought subject to the approval of an officer of the Department and must be bought subject to the tuberculin test. Preference will be given to animals from dams having satisfactory performance records. No animal under one year of age shall be eligible for a bonus.

(4) Societies obtaining assistance under these regulations shall make a report to the Department of the cost of such animals, the expense incurred in the transaction and the amount received for the animal if sold; and, the Society shall make an annual report to the Department of Agriculture upon live-stock conditions in the district, stating to what extent the bull has been used by members of the society, and what arrangements have been made for keeping the animal.

(5) Animals purchased with the aid of the Department shall be kept for the use of the members of that society only. The society shall make all arrangements for caring for the animal and shall agree to buy bulls of the same breed only and use them in that locality for a period of at least ten years.

(6) Assistance will not be given to more than two breeds in any one society. The breeds selected shall be determined by a majority vote of the members of the society, at a regular or special meeting and shall be subject to the approval of the Department of Agriculture. Notice of the vote to be taken shall be given to each member at least one week prior to the meeting.

(7) No society shall receive a bonus on more than five bulls and two females in any one year.

(8) The Department shall be notified if a society wishes to dispose of one of these animals, and shall be given a thirty days' option to purchase.

(9) Under the above regulations the Department shall pay an initial bonus of 20 per cent on animals costing more than \$50. A bonus shall not be paid on animals costing less than \$50. An additional yearly bonus of 10 per cent of the cost of the animal shall be paid for each year the bull is kept for breeding purposes, provided it is kept in satisfactory condition and passes an annual inspection. The yearly bonus shall not be granted to females.

(10) These regulations shall be considered as in force from February 1st, 1915, and shall cancel all other regulations.

In addition to the foregoing the Department of Agriculture pays 75 per cent of the prize list upon utility stock exhibited by the regular poultry associations. In so doing, classes, such as game birds, bantams, etc., are eliminated from the prize list, payments being made only upon stock considered of commercial value as producers of food products.

QUEBEC

BY J. ANTONIO GRENIER, DEPUTY MINISTER OF AGRICULTURE

AS a general rule the Department of Agriculture does not grant special subsidies to the breeders' associations, with the exception of the Live Stock Breeders' Association of the district of Beauharnois, which receives annual grants; last year this association received \$2,000.

There was no Provincial Poultry Breeders' Association before this year, but arrangements have just been made for organizing an association of this kind and the Minister has promised to give a substantial grant. There are seven or eight local associations which hold poultry fairs and which receive every year amounts varying from \$150 to \$250.

In order to encourage live stock breeding, the Department of Agriculture holds every year a live stock

sale at Quebec and Montreal, through the Breeders' General Association, to which the necessary amount is advanced; the deficit resulting from this sale is paid by the Government. Last year, the sum advanced was \$16,148.52.

Special grants and loans are provided for breeders' syndicates, agricultural associations and farmers' clubs to enable them to purchase pure-bred live stock. Last year, the total amount paid out in loans and special grants to agricultural associations was \$6,824.34. These associations have also spent \$17,509 out of their own funds for the purchase of live stock. Last year, the total amount paid to farmers' clubs as grants for the encouragement of live stock breeding was \$28,115 and the amount loaned was \$1,139.70.

ONTARIO

BY W. BERT ROADHOUSE, DEPUTY MINISTER OF AGRICULTURE

TO indicate the assistance granted by this Department to the live stock associations, perhaps I can best convey the information by appending a copy of the appropriations under the Live Stock Branch in this province. From these figures the nature and extent of the assistance granted to the live stock industry can be seen. The grants do not go direct to breed associations so much as to the asso-

ciations which carry on fairs and exhibitions in the special interest of live stock. Aside from this special work in the interest of live stock, a large proportion of the hundred thousand dollars, or so, which is spent in connection with the fall fairs throughout the province goes to the encouragement of live stock by reason of the live stock classes which are a part of these fairs:

Grant to Ontario Provincial Winter Fair, maintenance, poultry coops, Horse Show and Seed Fair.....	\$ 9,500
Grant to Eastern Ontario Live Stock and Poultry Show	8,500
Grants to local poultry associations and defraying expenses of meetings held in connection with poultry associations.	3,000
To provide for sheep-feeding experiments.....	300
Grants to associations holding sales of pure-bred stock, rebate of freight on animals purchased at such sales, and advertising sales.....	800
Grants to Horse Shows.....	2,500
Grant to Toronto Horse Show	500
Grant to Ottawa Horse Show.....	500
Prince of Wales' prize	50
Services and expenses in connection with the enforcement of the Stallion Enrolment Act.....	12,000
	<hr/>
	\$37,650

MANITOBA

THE grants made to live stock organizations by the Manitoba Department of Agriculture for 1916 are as follows:

Pure-bred Cattle Breeders' Association	\$ 700
Pure-bred Horse Breeders' Association	500
Pure-bred Sheep Breeders' Association	500

Pure-bred Swine Breeders' Association	300
Poultry Associations	1,000
Brandon Fair	1,000
To Ploughing Matches	1,000
Agricultural Societies	52,000

While the last four items do not come strictly under the heading of Live Stock Associations, the greater portion of the money given is spent in the interests of same.

SASKATCHEWAN

BY F. H. AULD, ACTING DEPUTY MINISTER OF AGRICULTURE

PROVINCIAL assistance to Saskatchewan live stock associations varies from year to year, and is based largely on the financial requirements of the associations to carry on their work. For several years the Cattle Breeders' Association has held an annual bull sale. The Sheep Breeders' Association in conjunction with the Swine Breeders' Association has held sales of sheep and hogs. The Horse Breeders' Association held a sale of pure-bred horses at the Winter Fair in 1914. Before the live stock distribution policy of the Saskatchewan Government was formulated, the Live Stock Branch working through the Cattle Breeders' Association purchased and distributed several carloads of dairy cattle from Eastern Canada.

Naturally the extent of the work of the associations and their financial necessities determined the amount of the Provincial grants from year to year. In 1915, grants paid by the province were as follows:—

Saskatchewan Horse Breeders' Association	\$ 400
Saskatchewan Cattle Breeders' Association	400
Saskatchewan Sheep Breeders' Association	400
Saskatchewan Swine Breeders' Association	300

Saskatchewan Poultry Association	300
Saskatchewan Stock Growers' Association	300
Total	\$2,100

Since the organization of the Live Stock Branch of the Saskatchewan Department of Agriculture, lines of work which of necessity previously devolved upon the associations have been taken up and enlarged by the Live Stock Branch. This is true to so large an extent that it is now a debatable problem whether or not the Live Stock Branch should exclusively carry on for Saskatchewan farmers many of the lines of work which have up to the present constituted the chief occupation of the associations. If so, the funds of the associations would probably be utilized very largely in defraying the expenses of an annual live stock men's convention. Conditions affecting the marketing of live stock in Saskatchewan are not matured as in the older provinces and many questions relating to production and marketing could be discussed with great profit at an annual conference of live stock men. The necessity for such a development is apparent and it is expected that a movement of this nature is near.

ALBERTA

FROM DATA SUPPLIED BY JAS. MCCAIG, EDITOR OF PUBLICATIONS

THE following items taken from the 1916 appropriations for agriculture in this province show clearly the financial assistance given to live stock and poultry associations:

To provide for holding a fat stock show.....	\$2,000
Grant to Cattle Breeders' Association.....	1,500
" Horse " ".....	1,500
" Sheep " ".....	400
" Swine " ".....	200
" Poultry " ".....	200
" Spring Stock Show, Edmonton.....	5,000
Total.....	\$10,800

The assistance given in the foregoing is direct; indirect assistance is shown by the following:

Expenditure under agricultural society ordinance, including grants to exhibition associations at Edmonton, Calgary, and Lethbridge of \$5,000 each.	\$110,000
To provide for expenses of official judges at exhibitions	6,000
To promote the work of live stock and agricultural institutes and associations.	15,000
Stock inspection.	8,500
To provide for expenditure in connection with brands and publication of official brand book.	10,000
Grant to Alberta Fairs' Association.	1,000
To promote and encourage the poultry industry.	8,000
Total.	\$158,500
Grand total.	\$169,300

Under the item showing the grants to the Edmonton, Calgary and Lethbridge Associations, 85 per cent of the prize money is paid on behalf of live stock premiums. The \$6,000 grant for judges is expended directly

for live stock improvement and the \$15,000 grant to live stock and agricultural institutes and associations is made for the encouragement of live stock work.

If Canada cannot supply your needs, give your preference to the products of the Empire—Great Britain and Ireland, Australia, New Zealand, South Africa, India, Ceylon, British West Indies. There are few, if any, essential articles that are not or cannot be produced within the Empire. Buy them in preference to goods from any other country. Keep your money within the Empire.—*Agricultural War Book, 1916.*

AGRICULTURAL LEGISLATION

PRINCE EDWARD ISLAND

OF the 34 acts passed by the Island legislature at the recent session, the most important to agriculture were: the Drainage Act, 1916; an act amending an act incorporating the Prince Edward Island Dairy Association and an act incorporating the Farmers' Union Co-operative Society. The Drainage Act of Ontario is closely followed in the Island Drainage Act, allowance being made for local conditions. Money for the work will be loaned by the Government, repayment to cover a term of years. In the act amending the Dairy Association Act, power is given to close any cheese factory or creamery that in the opinion of the Dairy Instructor is not conducted and kept in a sanitary manner. The purposes of the act incorporating The Farmers' Union Co-operative Society are indicated in the title. An act was also passed providing for the appointment of a Board of Trustees

to manage the consolidated school established at Hillsboro by Sir William Macdonald; another act provided for medical inspection in the schools of Charlottetown.

AGRICULTURAL APPROPRIATIONS

The estimates for agricultural purposes in 1916 are very much the same as for 1915 and call for the following:

Commissioner of Agriculture, part salary	\$ 900
Travelling expenses	350
Professor of Agriculture, part salary	1,400
Travelling expenses	300
Departmental expenses and contingencies	1,200
Printing and stationery	1,000
Exhibitions and live stock judging	9,250
Farmers' institutes and educational work	1,700
Encouragement of field crops, horticulture, dairying and poultry raising	3,000
Vital statistics	700
Total	\$19,800

NOVA SCOTIA

AT the recent session of the Nova Scotia Legislature two bills of special agricultural interest were passed. The first of these is entitled "A Bill for the Encouragement of Dairying by the Formation of a Dairymen's Association." By the terms of this bill provision is made for a Government grant to assist the Dairymen's Association, which has in reality been in existence for three years, in the holding of conventions, exhibitions of dairy products, etc. The president of this association for the current year is D. W. Murray of

Scotsburn, and the secretary, W. A. McKay, Dairy Superintendent for the province.

The second bill passed was the "Foul Brood Act." This Act makes provision for the appointment of apiary inspectors, whose duty it will be to examine any apiary where Foul Brood is suspected to exist, and if the disease is present in a virulent form, power is given the inspectors to order all the contents of the hives destroyed. Disposition of diseased bees, or infected appliances, by any other way than destruction, is made illegal.

APPROPRIATIONS FOR AGRICULTURE

General agriculture, including salaries, grants for dairying, exhibitions, entomological inspection, meetings, field and orchard demonstrations, competitions, agricultural societies, stallion enrolment, provincial and county farmers' associations, poultry associations. etc.		\$51,000
Agricultural College and Farm.		34,000
Total		\$85,000

In addition to the foregoing there was a capital appropriation of \$14,000 for minor additions to the Agricultural College Plant, for the completion of the Government

creamery at Margaree Forks and the Government Cereal Mills at Baddeck, and for the erection of another Government creamery.

ONTARIO

AT the recent session of the legislature of Ontario, two bills affecting agriculture were passed and some changes made in the operative divisions of the Department. The Colonization branch was re-transferred to the Department of Lands, Forests, and Mines, and the Factory Inspection branch and the Stationery Engineers' branch were amalgamated with the newly created Trades and Labour branch of the Department of Public Works.

IMPROVEMENT OF DAIRY PRODUCTS

"An Act to improve the Quality of Dairy Products" to be known as "The Dairy Standards Act" is one of the measures passed. After the customary clause explaining the terms used, the act provides that all milk and cream received at a factory shall be paid for on the basis of its fat content, as determined by the Babcock test, or on the basis of its fat content, as determined by the Babcock test plus the factor 2. In determining the fat content of milk supplied to a factory the measuring pipette must have a capacity of 17.6 c.c. officially stamped. In determining the fat content of cream supplied to a factory the sample of cream taken for testing must be weighed into a test bottle officially stamped and must weigh 9 or 18 grams. Section 4 states that for butter making

purposes at a factory, first-grade cream is to consist of cream suitable for making first quality butter and second-grade cream of all other cream accepted for making butter. Additional grades, if thought desirable, can be established by the Lieutenant-Governor in Council. Any person who over-reads or under-reads the Babcock test is liable to a penalty of not less than \$10 and not more than \$50. When the whey is returned in the same milk cans as the milk was hauled to the factory in, it must be properly pasteurized. The Lieutenant-Governor in Council can devise regulations that may be deemed necessary and impose penalties for violation of the provisions of the Act. Nothing in the Act is to apply to milk sold or offered for sale for human consumption. The Act is to come into force on the 31st day of March, 1917, with the exception of section 4, which is to take effect by proclamation of the Lieutenant-Governor in Council.

SHEEP PROTECTION ACT

The second measure passed is entitled "An Act to amend the Dog Tax and Sheep Protection Act" and amends section 3 of the act so entitled previously in force. It provides that sheep destroyed by dogs shall henceforth be paid for in full by municipal councils instead of an in-

demnity of two-thirds being paid as formerly. Municipalities are given permission to increase the annual tax on dogs to \$2 for one, \$3 for each additional dog, \$5 for a bitch, if only one, and \$6 for each additional bitch owned by the same person. All dogs must be included in the assessment roll or the assessor will be fined.

APPROPRIATIONS FOR AGRICULTURE

In the estimates a special grant of \$1000 is provided for the Guelph Winter Fair to clear up matters connected with last year's show. Another thousand dollars was voted to assist in the handling of co-operative live stock shipments to the West. The appropriations for the year ending Oct. 31st, 1917, are:

Civil Government, Printing Reports and Bulletins, Statistics, Miscellaneous	\$ 70,525. 00
Agricultural College	303,991. 00
Agricultural and Horticultural Societies	154,750. 00
Live Stock Branch	38,650. 00
Institutes Branch	30,800. 00
Bureau of Industries	5,500. 00
Dairy Branch	62,000. 00
Fruit Branch	53,700. 00
Ontario Veterinary College	30,800. 00
Miscellaneous (including \$80,600 for District Representatives)	121,800. 00
Total	\$872,516. 00

SUPPLEMENTARY ESTIMATES

The supplementary estimates to be added to the agricultural appropriations for the year ending October 31st, 1916, are:

Agricultural and Horticultural Societies	\$18,894 66
Live Stock Branch	1,502 53
Various Institutes	259 54
Dairy Branch	712. 70
Fruit Branch	1,668 12
Ontario Veterinary College	257 77
Ontario Agricultural College	5,500 00
Animal Husbandry, etc	500 00
Field Experiments	500. 00
Poultry Department	500. 00
Miscellaneous	5,966 70
Civil Government	697. 48
Special grant to Ontario Winter Fairs	1,000 00
Total	\$37,959 50

EDUCATIONAL GRANTS

The votes for the year ending Oct. 31st, 1917, for agricultural instruction through the Department of Education are:

Instruction in Agriculture and Horticulture and grants to School Gardens	\$4,500 00
School Gardens for Normal Schools	1,000. 00
Travelling expenses of Normal School Students for Nature Study	1,500 00
Agricultural Training in High and Continuation Schools	3,500. 00
Special Industrial and Agricultural Education	5,000 00
Total	\$15,500. 00

MANITOBA

BY GEORGE BATHO, EDITOR OF PUBLICATIONS, DEPARTMENT OF AGRICULTURE

THE Manitoba Legislature, at its midwinter session, passed some legislation that will have rather an important bearing upon agriculture.

THE NOXIOUS WEEDS ACT

One of the provincial acts that was given a thorough overhauling was the Noxious Weeds Act.

Instead of there being one provincial weeds inspector, a commission of three has been appointed, being Prof. S. A. Bedford, chairman, and Messrs. George Walton and H. Brown.

Hitherto a large list of weeds was classed, without differentiation, as noxious, and the Act gave power to the weeds inspector to enter any farm where these weeds were found and have such crop cut down. The complete enforcement of the Act would have meant ruination to thousands of farmers, and only a limited enforcement was possible.

The Act, as revised, divides noxious weeds into two classes, and applies quite different treatment to these separate sections. In class 1 are placed perennial sow thistle, Canada thistle, Russian thistle and tumbling mustard; the other weeds fall into Class 2.

Class 1 includes those dangerous weeds that spread readily by seeds or by rolling plants from one farm to another, and, therefore, form a distinct community menace; those in Class 2 are the weeds that do not so readily spread.

A new section of the Act stipulates that there may be levied against lands infested with weeds of Class 1, a tax of 50 cents per acre, and that this tax shall become collectible with other municipal taxes. When the tax is placed against the lands, however, the owner or occupant

shall be instructed as to what steps he should take in an effort to eradicate these weeds; and if the inspector finds that the instructions have been followed the tax shall be remitted.

A greater amount of work is placed upon the municipal weed inspectors than heretofore. Each municipality must engage an inspector for at least five months each year, and he must give his entire time to the weed work. This inspector must visit and report upon every quarter section in his district. By means of these reports the Commission hopes to be able to make up weed maps showing the distribution of weeds in all parts of Manitoba; also to ascertain the relative effectiveness of the different methods of eradication attempted by farmers.

It is part of the policy of the Commission to co-operate as fully as possible with the municipal councils, and a conference with every one of these bodies was held before May 15th.

On public highways and railway right-of-ways all noxious weeds must be destroyed, the obligation in the former case resting upon the occupant of the adjoining farm, and in the latter case upon the railway company.

THE HORSE BREEDERS' ACT

Very important departures are undertaken under the Horse Breeders' Act. For several years it has been obligatory that every stallion stood for profit in this province should be annually enrolled with the Manitoba Department of Agriculture. Under the new Act, every stallion stood for profit must not only be annually enrolled, but he must also be recorded in a recognized stud book in order to secure enrolment. In other words, only

pure-bred stallions are now to be stood for public service. Every importer or breeder, before offering a stallion for sale, must have such a stallion enrolled with the Department.

Before a stallion can be granted what is known as Certificate A, he must be inspected by one of the travelling provincial veterinary inspectors, who shall examine the horse and report to the board of enrolment regarding the following considerations: Breed type, conformation and soundness of the horse examined, and the desirability of having such stallion used as a sire. No report is to be made by the inspector to the stallion owner.

The Board of Enrolment, having assured itself as to the validity of the horse's registration certificate, will consider the veterinarian's report and grant such certificate as the case warrants.

Four kinds of certificates are provided for under the Act: A, which certifies that the horse is registered in a recognized stud book, is free from hereditary disease, and is licensed to stand; B, which certifies that the horse is registered in a recognized stud book, is found to be suffering from hereditary unsoundness (indicated in each case by name), but is licensed to stand; C, an interim certificate granted for one year to sound horses that may not otherwise be all that is desired, but that shall be re-examined at the end of twelve months; D, an interim certificate granted to owners who have duly applied to have their horses inspected, but which the veterinary inspectors may not yet have been able to inspect.

The new features of the Act are that nothing but a pure-bred registered horse can be stood for public service; that the Department's own veterinary inspectors examine all horses for soundness; and that conformation and the general desirability of having the horse used as a sire are considered.

'SETTLERS' ANIMAL PURCHASE ACT

This is an entirely new Act. Its necessity arises out of the fact that we have in a few parts of Manitoba settlements of needy farmers, mostly foreign born, whose lands are not well adapted to grain growing, but who have not sufficient means of their own to purchase such cattle as would enable them to succeed in mixed farming. The object of what is commonly called the "Cow scheme" of the Minister of Agriculture is to sell cattle on time to settlers on these lands. Well-to-do farmers or those who are not in a position to care for cows are not to be included in the list of those to be helped. A circular prepared by the Hon. Mr. Winkler, Minister of Agriculture, states:

"For convenience in distributing these cattle, and in order that they may have the best of care, the law provides that those who wish to have the stock under this plan shall organize themselves into groups of ten, and that each member of the group shall receive not more than five head of cattle, for which he agrees to make payment to the Government in five annual instalments, with interest at 7 per cent; also that he agrees to guarantee one-tenth more than the cost of his stock to cover a part of any loss that might arise as result of a member failing to meet his liability.

"Those who wish to receive stock should get together in groups and organize, with a president and a secretary. A list of those who are to form the group should be made, having a care for good character and the necessary feed and knowledge to keep cattle well; also the ability to meet the payments when due.

"When stock has been supplied to settlers, the Minister of Agriculture may send an inspector at any time to report upon its condition, and to suggest methods of care that may be for the well-being of the stock. The stock will be branded with the brand of the province of Manitoba, and remain the property of the province until paid for in full. Each person who receives cattle shall give as security for the payment for the same a lien upon his lands to the value of the stock supplied."

SOME CHANGES IN THE DAIRY BUSINESS

The dairy industry will be somewhat affected by recent legislation. New sections have been added to the

Dairy Act demanding the registration in the offices of the Department of Agriculture of all skimming stations and cream receiving stations. Before the license can be issued a number of requirements as to sanitary surroundings, equipment, etc., shall be satisfied.

Also it is demanded that every factory cheese maker, creamery butter maker, operator of a skimming station or operator of a cream receiving station shall be licensed by the Department of Agriculture.

WOOL SELLING

The plan followed last year by the Department in the way of acting as selling agent for wool consigned by farmers will be continued this season.

DEMONSTRATION FARMS

During the past three years the province has conducted 40-acre demonstration farms in different parts of Manitoba. The Minister of Agriculture does not believe that the work upon these small areas has been as valuable as it should be, and he is discontinuing the policy of carrying these on and intends to establish instead a few larger demonstration farms that shall be moderately equipped and farmed more nearly upon a paying basis.

DISTRICT REPRESENTATIVES AND INSTRUCTORS

The number of district representatives has been increased. Also two new dairy instructors have been appointed to work among the non-English speaking people. These two men are both able to speak the Ruthenian language.

LITERATURE

In the past the various heads of the departments of the Manitoba Agricultural College have written some excellent bulletins, but these have

appeared somewhat irregularly. The Department has now established a monthly bulletin service, the series being known as the "Manitoba Farmers' Library," one bulletin being published each month. These bulletins are sent free to farmers making application. It is expected that most of these bulletins will be on agricultural or domestic matters and be written by professors in either the agricultural or domestic science branches of the Manitoba Agricultural College.

A poster service has been commenced, popular posters being sent out at frequent intervals and posted all over Manitoba. These will be written mostly by the Agricultural College professors.

A series of news letters on agricultural matters has been commenced by the Publications Branch of the Department, and every newspaper in Manitoba is kept supplied with live news upon agricultural topics.

FARM LABOUR

The Immigration and Colonization Branch has been reorganized. A splendidly equipped office has been opened at 439 Main Street, Winnipeg, in the very heart of the city, and an agency established at St. Paul, Minnesota. Active steps have been taken this spring, and will be taken all season, to supply farm helpers to all applicants.

APPROPRIATIONS FOR AGRICULTURE

The following estimates were passed for the Department of Agriculture and Immigration:

Salaries.....	\$ 13,700 00
Expenses.....	3,000 00
Agriculture and statistics.....	89,450 00
Agricultural College.....	203,289 35
Immigration and publicity....	41,000 00
Protection of game.....	25,000 00
Miscellaneous (including hospital grants).....	132,802 70

Total..... \$508,242 05

SASKATCHEWAN

AT the last session of the Saskatchewan Legislature considerable legislation affecting agriculture was enacted. The following is a brief summary of the principal agricultural enactments:

THE HORSE BREEDERS' ACT

The number and kind of license must be given on the bill or poster advertising the stallion. Only the owners of enrolled stallions are allowed to have these bills or breeding cards, and the owner of an unenrolled stallion may not advertise its services or charge service fees.

The manner in which a municipality may withdraw from the licensed stallion district is now defined. Having been three years incorporated in the license stallion district, the municipality wishing to withdraw must pass and forward to the minister a resolution expressing the opinion that it would be in the interest of the horse-breeding industry to do so, and the minister may then declare the municipality to be no longer a part of the licensed stallion district.

The license of a stallion eight years or more of age (unless revoked for cause) will be valid until the death of the horse. Formerly ten years was the limit to which this provision applied. As before, licenses for younger animals are valid for three years only.

The tariff of fees has been slightly changed, the principal alteration being that whereas in the past the enrolment fees for grade, cross bred and scrub stallions were \$3, \$4 and \$5 respectively, in future the fee for each is to be \$5. The annual renewal fee is raised from fifty cents to one dollar.

THE DAIRYMEN'S ACT

The Dairymen's Act has been consolidated so that it now includes all the amendments made on the four different occasions when changes were made since the year 1906, when

the Act first came into force. No changes have now been made affecting the main principles under which co-operative creameries are operated.

A change has been made in the terms of repayment of the loan which the government may make to a creamery company. The rate of interest is raised from 3 to 6 per cent, but the time for repayment may be spread over ten years instead of five as formerly.

An entirely new section has been added providing against discrimination on the part of a company or person by paying a higher rate for milk or cream in one district than in another, or to one person than to another, after allowing for any difference in the cost of transportation. A penalty up to \$200 may be imposed for this offence, and, in addition, a company guilty in the Minister's opinion of this practice is liable to have its certificate of incorporation cancelled.

The certificate of incorporation is also liable to be cancelled if returns, called for annually, are not submitted by January 10 of each year. Provisions have been added that the liabilities in such a case are to be continued, and also for the issue of a new certificate on payment of \$100. It is made possible for a company to appeal to the court to have its name restored to the register, as provided by section 29 of The Companies Act.

Companies not incorporated will in future have to print on all stationery in letters of a certain size, the words "Not Incorporated."

THE STRAY ANIMALS ACT

The most important change in this Act is that whereas formerly a by-law to restrain animals from running at large had to apply uniformly to all parts of a municipality, the council of a municipality is now given power to exclude certain portions of the municipality to which the by-law

shall not apply.

No animal which has been exposed to risk of infection from blackleg is to be allowed to run at large until thirty days after the disease has apparently disappeared from the herd with which it was running. It is also made unlawful to allow any animal with lumpy jaw to run at large.

Heavy penalties are provided for violation of these provisions.

Section 6 providing for a referendum to the electors of the question whether horses and cattle should be allowed to run at large has been repealed, and any decision of the rate-payers under this section is no longer binding upon the council.

APPROPRIATIONS FOR AGRICULTURE

Civil Government	\$40,795.00	
Assistance to General Agricultural Interests.	67,600.00	
Assistance to Live Stock Industry	30,300.00	
Assistance to Dairy and Poultry Industry	71,100.00	
Publicity and Statistical Work	26,900.00	
Bacteriological Laboratory	8,400.00	
Weed Control, Seed Inspection and Exhibitions	8,900.00	
Bureau of Labour.	9,600.00	
Game Protection and Museum	10,100.00	
Administration of The Agricultural Aids Act	89,000.00	
Miscellaneous services	9,100.00	
		\$371,795.00
DEPARTMENT OF EDUCATION		
Agricultural Extension Work.	\$24,000.00	
Grants to Districts employing Supervisors in School Agriculture, Household Science, Manual Training, Music, Art and Physical Training	1,800.00	
Total		\$25,800.00
		\$397,595.00

ESTIMATE OF REVENUE

Reimbursement of advances for operation of creameries.	\$60,000.00
Game and other fees	35,000.00
Casual revenue	500.00
The Agricultural Aids Act	89,000.00
Total	\$184,500.00

ALBERTA

BY JAS. MCCAIG, EDITOR OF PUBLICATIONS

AT the 1916 session of the Alberta Legislature the following legislation affecting agriculture was enacted:

STOCK INSPECTION

By legislation of the previous session, special stock inspectors were appointed at Calgary and Edmonton and inspection was likewise required for either auction or private sales of stock at other places; all stock sold at auction had to be listed and lists posted and brands specified three hours before the opening of the sale; stock changing hands within the province was not subject to inspection.

The amendments of this session make the inspection of stock at points of destination easy and effective by requiring the shipper to supply to agents for attachment to shipping bill, a list of stock shipped, the shipper to sign for list with inspector at local point and the consignee to deliver the list to the inspector to check from at point of destination.

Provision is also made for the inspection of all stock shipped whether to points within or without the province.

Section 8A of the Brand Act relating to inspection requirements for stock in the hands of drovers is

now made part of the Stock Inspection Act.

Anyone offering beef for sale in any city or incorporated town shall present the hide of the animal slaughtered and shall have it inspected for brands and have both hide and carcass stamped by the inspector.

The regulation requiring the posting of lists of stock three hours previous to the time of sales of stock by auction is changed with respect to the three hours time. Lists are to be posted at the beginning of the sale.

WOMEN'S INSTITUTES

An Act respecting women's institutes provides for the organization of societies and fixes the qualifications of members. It determines the officers, the committees, the order of business and makes provision for the framing of by-laws, the making of returns to the Department and for the appointment of a superintendent and other officers. It also provides for the appointment of an advisory as counsel to the Minister in relation to women's institutes.

APPROPRIATIONS FOR AGRICULTURE AND STATISTICS

(1) Expenditure under Agriculture Society Ordinance, including grants to exhibition associations at Edmonton, Calgary and Lethbridge of \$5,000 each	\$110,000
(2) To provide for expenses of official judges at agricultural exhibitions	6,000
(3) To promote the work of Live Stock and Agricultural Institutes and Associations	15,000
(4) To promote and encourage the production of Pure Seed Grain, and Provincial Seed Fair	4,500
(5) Administration of Demonstration Farms	15,000
(6) To provide for holding a Fat Stock Show	2,000
(7) *Purchase and Equipment of Demonstration Farms	7,000
(8) Destruction of Grey or Timber Wolves	2,000
(9) Destruction of Noxious Weeds	25,000
(10) Stock Inspection	8,500
(11) To provide for Expenditure in connection with Brands and publication of Official Brand Book	10,000
(12) Collection and Compilation of Vital Statistics	11,000
(13) Collection and Compilation of Medical, Agricultural, Industrial and other Statistics	3,000
(14) To provide for expenses in connection with the Protection of Game	30,000
(15) To promote and encourage Dairy Work	15,000
(16) Operation of Demonstration Farms	50,000
(17) Operation of Schools of Agriculture	20,000
(18) Grant to Cattle Breeders' Association	1,500
(19) Grant to Horse Breeders' Association	1,500
(20) Grant to Sheep Breeders' Association	400
(21) Grant to Swine Breeders' Association	200
(22) Grant to Poultry Breeders' Association	200
(23) Grant to Alberta Fairs Association	1,000
(24) *To assist Creameries, not exceeding \$1,500 to each Creamery	4,500
(25) Expenditure under Prairie Fires Ordinance	2,500
(26) Grant to United Farmers' Association	2,000
(27) Expenditures for Immigration, Colonization and Advertising	20,000
(28) Contingencies	1,000
(29) To promote and encourage the Poultry Industry	8,000
(30) Grant to Alberta Natural History Society	100
(31) To procure Mounted Specimens of Animals, Birds, etc., for Decorative and Museum Purposes	500
(32) To provide for Scholarships for Students attending Agricultural Colleges	500
(33) Grant to Alberta Fish and Game Protective Association	100
(34) Grant to Spring Stock Show, Edmonton	5,000
(35) Women's Institutes, and Grants to same	3,000
(36) Grant to Western Canada Irrigation Association	500
(37) *To provide for Advances under Elevator Act	200,000

Total \$586,500

* Chargeable to capital.

NOTES FROM DISTRICT REPRESENTATIVES

QUEBEC

DORCHESTER AND BELLECHASSE COUNTIES

M. Abel. Raymond, B.S.A.:—

"The farmers of this district have been greatly benefited by the agricultural week. I made the most of this opportunity by giving lectures on growing feed roots, growing vegetables, and canning tomatoes. A special lecture was given for women and girls. At night, the subjects discussed were arboriculture, horticulture, and the necessity to increase our agricultural production. All lectures were illustrated with lantern slides.

"A number of bee-hives which had passed the winter in a damp and poorly ventilated cellar came out very weak. The honey stores were covered with mould; this was the chief cause of mortality among the bees. I advised this farmer to feed his bees with comb honey or white sugar syrup, one pound of water to one pound of sugar.

"In order to encourage the production of milk-fed calves, I went to St-Valier to confer with the manager of the model slaughter house, and I was accompanied by several farmers who expressed their approval of this step. We also discussed an organization for the marketing of eggs in spring and summer. Where the cheese or butter maker belongs to the Quebec Cheese Makers' Co-operative Society it might be practical to make the factory a centre for the delivery of eggs. The cheese maker might test the eggs, grade them, and ship them every week with his produce. There may be objections to this practice, but is it not worth a trial?

"Several lectures with demonstrations were given at the best sugar makers' places.

"I also examined the breeding animals of the farmers' clubs to see if they were well cared for."

ROUGEMONT AND ROUVILLE COUNTIES

M. Henri Cloutier, B.S.A.:—

"An agreement has just been passed with the St.-Hilaire Co-operative Society for the purchase of insecticides and fungicides.

"Several lectures were given on the selection and the cleaning of the seed grain, the growing of ensilage corn, the construction of barns and silos, the production of milk during winter and the making of maple syrup and sugar. The orchard demonstrations on tree pruning are better attended than ever."

CHAMPLAIN COUNTY

M. J. A. Fortier, B.S.A.:—

"We are working hard to improve the dairy herds by encouraging the adoption of better breeding and feeding methods, and I am endeavouring to increase the production of eggs in winter and summer by encouraging artificial hatching. It is hoped that these efforts will help in the development of agriculture and the increase of production, which is so necessary at the present time.

"The school garden movement has made marked progress. Graded eggs are distributed to the pupils, who have them incubated and show the chicks at the school fairs. The lectures on market gardening were well attended by the farmers' wives. There will be an increase in hoe crops this year."

PORTNEUF COUNTY

M. J. C. Magnan, B.S.A.:—

"At the seed grain fairs several farmers subscribed shares to the stock of the Seed Growers' Association of Ste. Rosalie.

"The Quebec Department of Agriculture has made a free distribution of eggs and pure-bred fowls to the members of the Champlain Women's Institute. Work has been planned by the Club for the summer of 1916. Special attention will be given to vegetable growing, bee-keeping, etc.

"An agricultural school museum has been placed at the St. Casimir college. This museum contains all the apparatus that may be helpful in the teaching of agriculture in elementary schools.

"A clover seed thresher has been purchased by the agricultural society of St. Casimir, and several farmers will have from 150 to 200 pounds of good seed grain to sow this year.

"At the request of His Highness Arch. Cloutier and Canon Massicotte a new association has been established, which will be known as the Three Rivers Women Garden Association. The members of the association will operate a demonstration garden on the growing of vegetables and flowers.

"Several demonstrations were given on pruning fruit trees and taking out the bee-hives.

"The parish of St. Guillaume has 14 schools, 13 of which will start school gardens this spring. Over 2,000 eggs have been distributed to the school children".

QUEBEC AND MONTMORENCY COUNTIES

M. A. Desilets, B.S.A.:—

"Pruning was done in several orchards and the bee-keepers were visited for the last time before the taking out of the hives.

"Several demonstrations were given on the confection of hot-beds. An experiment on alfalfa growing will be conducted on the farm of the secretary of the Farmers' Club at St-Jean, I.O.

"On Arbour day there was a great demonstration at the Reverend Brothers of Beauport. Fruit trees and shade trees were planted.

"Work was planned for the Women's

Clubs. Several new school gardens will be established this spring."

BAGOT COUNTY

M. J. M. Leclair, B.S.A.:—

"I made an enquiry to find out if breeding animals lent to the members of agricultural societies were cared for as they should be. Some of these animals are not fed as well as they should be. The clubs change breeds too often, the farmers not having time to form a herd presenting a uniform type. The breeding animals are put into service too soon, and they are sold too early, at an age where they could still give the best results."

DRUMMOND COUNTY

M. R. A. Rousseau, B.S.A.:—

"Much encouragement to vegetable growing and floriculture is given by the Clergy, the Board of Trade, the City Hall, the School Board, and prominent persons in the city of Sherbrooke, wherever vegetables or flowers can be grown, around the schools, the public buildings, manufactures, etc.

"The farmers show great interest in the lectures on the propagation of fruit trees by grafting."

ONTARIO

LANARK COUNTY

Fred Forsyth, B.S.A.:—

"The Almonte Agricultural Society has been much enthused over the work of their Junior Farmers' Improvement Association, so much so that they have invited the Association to appoint one of its members to their board. This I take as a good omen, and I feel sure we will have some new ideas introduced, at least one stock-judging competition."

DUNDAS COUNTY

E. P. Bradt, B.S.A.:—

"Some of the fruit growers in this district have suffered quite a loss caused by the mice girdling their young trees. I was in an orchard, at the request of the owner, during the week and found that about 50 per cent of an orchard of close to 1,000 trees was completely girdled by mice. Some of the trees can be saved, but a large

number will be lost. Some of the trees have been out 5 or 6 years. I spent half a day in his orchard doing some bridge grafting work and showing him the method of doing this.

"I was in another orchard at Iroquois, of about 600 trees. I had strongly advised this man to wrap his trees with building paper last fall and he had looked after the trees in that way, and as a result out of 600 he only had three trees that were injured by mice and these were where the paper had not been put close to the ground and the mice had worked underneath it. His orchard would have suffered the same fate as the other, had he not put the paper on the trees."

SIMCOE COUNTY

J. Laughland, B.S.A.:—

"During the past week, we have been busy getting material packaged up for school fair work. We find a greater interest in school fairs this year than last;

schools that only had a small number of plots, this year have almost as many plots as pupils. Some boys and girls who last year were indifferent about taking seeds in sections where the fairs were held, are very anxious to get the material for this year. In 1915, the work embraced 95 schools in the county with 2,100 plots, which included between four or five hundred war plots. This year we have 102 schools with 2,645 plots. Applications are yet expected from a few schools."

HALTON COUNTY

W. F. Strong, B.S.A.:—

"I have made visits to a few secretary-trustees this week and find that they are all willing to give the usual grant for school fair work. One board of trustees, without being solicited, offered to give \$8 this year instead of \$5. They said they knew the money would be well used for a good cause."

RENFREW COUNTY

M. H. Winter, B.S.A.:—

"On Friday of last week, the members of our Glasgow Homemakers and Junior Farmers to the number of forty gathered for a business and social meeting. The boys met at 4 o'clock, discussed competitions and work which they are carrying on this summer. At six o'clock all sat down to supper which was prepared by the members of the Domestic Science class. In the evening a public meeting was held at which fully one hundred were present. The main item on the programme was a debate 'Resolved that Western Canada offers Greater Opportunities than Eastern Canada'. Two members of each class took part on either side and creditably conducted themselves, the affirmative winning the decision. Recitations, short speeches and music were included in the programme after which a social hour was

spent by the classes and their friends. The classes have decided to hold a picnic June 3rd or there about, at Roddy's Bay, on the Ottawa."

OXFORD COUNTY

G. R. Green, B.S.A.:—

"So far we have held directors' meetings in each of the school fair districts in the county, and we are trying to work out a scheme, whereby we can use our prize list for all the districts, the only changes necessary being on the first and last pages. On the first page would be the place and date, and names and addresses of officers and directors, while on the last page would be the names of those on the different committees who are to be in charge of the various classes at the fair. There have been some good suggestions offered at the various meetings, and this week I am making arrangements to meet the two school inspectors to talk over the proposition, and decide, from the suggestions already offered, on something that will make a satisfactory prize list. This will cut down the expenses of the fair, and will be easier for all concerned.

"I might also mention that Mr. Cole, Inspector for North Oxford, came in this morning with a plan for making use of our work in connection with agricultural instruction in the schools. He has been considering this idea for sometime, and has decided that for another year we work out a scheme, by which the teacher can make use of all the practical work which we are doing, and promote agricultural teaching in the school. His idea is that another year we give ten different things to the schools, and during each month of the school year, each one of these will receive consideration, and will be taught by the teacher in the school. The information for the teachers will be sent out from this office, and one set can be worked out for all the schools in the county, and all literature run off on the duplicator."

"There is, I believe, a call now—a most earnest and special one—for service and sacrifice by everyone in this province and in every part of the Dominion, and every reasonable step should be taken at this time of stress and strain that will add to the strength of the country and conserve our resources in every way possible for the great task. It is surely a time for all of us to abstain from luxuries and extravagance in what we wear and what we eat as well as in what we drink."—*Premier Hearst of Ontario.*

QUEBEC

BACON HOG CONTEST

THE Quebec Department of Agriculture is this year conducting a bacon hog contest for boys in 25 counties of the province. Realizing the importance of the bacon hog to Quebec agriculture, the contest is being arranged in the hope that the boys and girls may be interested in bacon production.

The rules and regulations governing the contest are:

1. This competition is open to any boy under eighteen years of age at time of entry.

2. Applications for entry in this competition must be made on the regular form provided by the Quebec Department of Agriculture, and forwarded to the Department of Agriculture before May 31st, 1916. Forms may be had by applying to the Department of Agriculture.

3. Each contestant must feed and exhibit two hogs. Three hogs may be fed, however, and from these a selection of two made before time of exhibition.

4. Hogs must be weaned at the age of six weeks, and competition will date from time of weaning.

5. Each contestant must personally select, feed, and care for his entry. No restriction will be made with regard to breed, feed, or feeding.

6. An accurate account must be kept of all feeds, in kind and amount, from time of weaning until time of exhibition. Forms will be provided for this purpose and failure to comply with this regulation will disqualify the contestant.

7. Within two months after weaning, hogs will be inspected and marked by a representative of the Department of Agri-

culture, and the Department will reserve the right to inspect and investigate any entry at any time. In case of dispute, decision of the Department representative will be final.

8. The judging will be done by men appointed by the Department. The awards will be made on the following basis:—

(a) The suitability of the hogs for the export bacon trade in regard to type, condition, finish, and general appearance as set out in score card.

(b) General character of contestant's work throughout the competition.

10. Notice and time of exhibition will be given during the month of August.

The prizes will be awarded as follows:—

In case of 1 to 3 exhibits, one prize: first, \$6.00.

In case of 4 or 5 exhibits, two prizes: first, \$6.00; second, \$5.00.

In case of 6 or 7 exhibits, three prizes: first, \$6.00; second, \$5.00; third, \$4.00.

In case of 8 or 9 exhibits, four prizes: first, \$6.00; second, \$5.00; third, \$4.00; fourth, \$3.00.

In case of 10 or 11 exhibits, five prizes: first, \$6.00; second, \$5.00; third, \$4.00; fourth, \$3.00; fifth, \$2.00.

In case of 12 or more exhibits, six prizes: first, \$6.00; second, \$5.00; third, \$4.00; fourth, \$3.00; fifth, \$2.00; sixth, \$1.00.

In no cases will prizes be awarded where pigs do not score at least 50 points.

The score card to be used in judging allows 50 points for type; 20 points for weight (175-225 lb. live weight); 20 points for condition and finish, and 10 for general appearance. Total 100.

DAIRY INSPECTORS IN CONVENTION

BY M. ALEXANDRE DION, SPECIAL OFFICER

UNDER instructions from the Hon. Jos. E. Caron, Minister of Agriculture, the Quebec local inspectors of cheese and butter factories meet every year, before the

opening of the season, in two groups at St. Hyacinthe and Quebec respectively, where they receive full instructions on their duties. The province is divided into 50 territories, each

under charge of a local inspector, and in five districts, under the immediate supervision of five assistant-inspectors general, who are themselves under the control of two general inspectors, one for the creameries and the other for the cheese factories. All of them receive their instructions from the Department of Agriculture.

These meetings were held at St. Hyacinthe and Quebec in April. The speakers, all of whom confined their remarks to special features of the dairy industry, included Mr. Alex-

andre Dion, Special Officer and Chief of the Dairy Department; Mr. J. D. Leclair, General Inspector of Creameries; Mr. Elie Bourbeau, General Inspector of Cheese Factories; Mr. A. T. Charron, Official Chemist of the Government Laboratory; Mr. O. E. Dalaire, Secretary of the Dairymen's Association, and Mr. G. E. Marquis, Chief of the Quebec Bureau of Statistics. The meeting at Quebec was presided over and addressed by Mr. J. Antonio Grenier, Deputy Minister of Agriculture.

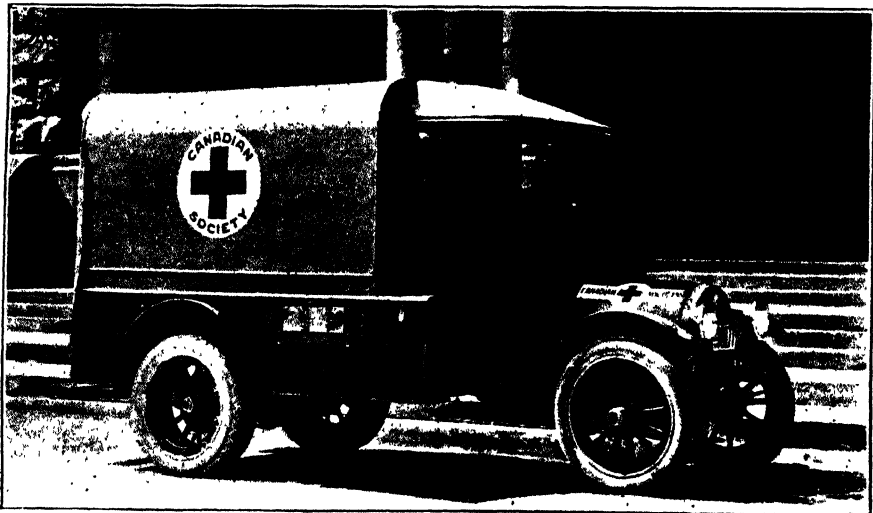
ONTARIO

CHILDREN'S POTATO WAR PLOT FUND

BY C. F. BAILEY, B.S.A., ASSISTANT DEPUTY MINISTER OF AGRICULTURE

IN the spring of 1915 the Ontario Department of Agriculture offered to supply children taking part in the Rural School Fairs with sufficient potatoes to plant a plot of

District Representatives and the children showed great interest in the work, so much so that the prospects in the early part of the season were that a very large quantity



MOTOR AMBULANCE DONATED TO THE CANADIAN RED CROSS BY THE CHILDREN OF THE RURAL SCHOOL FAIRS IN ONTARIO

1 x 2 rods if they would agree to dispose of the crop and contribute the money to some patriotic cause. Applications were received through the

of potatoes would be produced. Unfortunately, however, the season proved to be very unfavourable for the potato crop and greatly reduced

the yields. In many cases the potatoes suffered so severely from rot that they were not worth digging. However, thirty-four counties taking part in the work reported sales from over 2500 children's plots and the Department has received up to date \$1843.18.

In order to create special interest in this work the children's Potato War Plots were inspected and prizes given for the best kept plots. A medal was also given to the boy or girl in each county producing the greatest yield of marketable potatoes from his or her plot.

Before deciding upon the disposition of the money received from the children, the officers of the Canadian Red Cross Society were consulted, with the result that a McLaughlin Motor Ambulance was purchased and formally presented to the Red Cross by the Hon. Jas. S. Duff. The letter of presentation from the Minister of Agriculture and a letter from Colonel Noel Marshall, Chairman of the Executive Committee, acknowledging the same are given below:--

TORONTO, April 19, 1916.

DEAR SIR, -

I have great pleasure in presenting to you herewith for the purposes of the Red Cross organization of this province a motor ambulance. This ambulance is purchased with the proceeds from the sale of potatoes grown during the season of 1915 by 2,500 school children in all sections of the province, organized through the Rural School Fair work carried on by the Ontario Department of Agriculture. I am therefore acting on behalf of these children in presenting the ambulance to you to-day and in voicing their sentiments that it may be used to relieve the suffering occasioned by this war, and thereby contribute to the ultimate victory to which we all look forward with confidence. Further, may I

add that in this case it is in a special sense more blessed to give than to receive, because I feel that the work which has been done by these young boys and girls and the knowledge that they have thereby had a part in this great war will have a very beneficial influence on their citizenship in later years.

Yours very truly,
(Signed) JAS. S. DUFF,
Minister of Agriculture.

COL. NOEL MARSHALL,
Chairman, Executive Committee,
The Canadian Red Cross Society,
Toronto.

Canadian Red Cross Society,
77 King St. East, Toronto,
April 19, 1916.

HON. JAS. S. DUFF,
Minister of Agriculture,
Parliament Buildings,
Toronto.

DEAR MR. DUFF:--

In further reference to the presentation, which took place this afternoon, I desire to say on behalf of the Executive Committee of the Canadian Red Cross Society that I shall be very grateful if you will take some means of conveying to the children of the province just how grateful we feel.

The Ambulance will be shipped from Montreal by steamer next week, and it should not be long before it will be rendering service to our wounded soldiers. The knowledge to each of these children that they have contributed to the comfort of the brave fellows who are serving us at the front will, I am sure, amply repay them for their efforts.

Yours faithfully,

(Signed) NOEL MARSHALL,
Chairman, Executive Committee.

The inscription on the plate on the ambulance is as follows:--

"The children of the Rural School Fairs in Ontario, Canada, organized by the Ontario Department of Agriculture, donated this car from proceeds secured from sale of potatoes grown by them for this purpose, 1915".

SPRING REPORT ON BEE-KEEPING

ARRANGED BY MORLEY PETTIT, PROVINCIAL APIARIST

THIS year the forms for reporting the winter loss and the condition of the clover were sent out earlier than usual. From

the first reports a heavy winter loss was anticipated, but those received later are more favourable.

Eight hundred bee-keepers reported

27,738 colonies in the fall and 24,953 colonies in the spring, showing a winter loss of 2,785 colonies, or 10 per cent. There are probably fewer bee-keepers in this province today than a few years ago, due largely to the winter loss, diseases and possibly to the extra farm work and shortage of labour from war demands.

The mild spell in January caused the bees to rear brood and draw heavily on their stores. This, with the high price of sugar last fall causing a stint on feeding heavily, resulted in many colonies starving towards the end of the cold weather. A few warm days early in April gave the bees a splendid cleansing flight and their condition now is reported as very good. The continued cold, wet weather has retarded building up and the gathering of fresh stores, and many colonies may perish if neglected.

While the reports were only sent to a revised list of active bee-keepers, 164 were returned with the remark, "Not a Bee-keeper." The careless, indifferent bee-keepers with only a few colonies are rapidly disappearing, and the honey producing industry is becoming a specialist's occupation. At least it may be stated that while the number of colonies of bees in the province has not increased, there are more extensive pro-

ducers and fewer small bee-keepers. From the standpoint of honey production, this is a much desired condition, indicating that the industry is getting on a better business basis from year to year.

Further evidence of the progress of the industry is the number of honey extractors in use. Some of the 800 bee-keepers reporting undoubtedly produce comb honey, and, hence, have no extractor, but 574 extractors of different sizes are in use. Twenty-one bee-keepers are using power machines. Many more could probably be profitably employed. Of the 553 hand honey extractors in use, 201 are two-frame and 178 four-frame. Sixteen bee-keepers are using motor cars to advantage. The increasing number of out-yards will undoubtedly increase the number in use.

The clover prospects are very good throughout the Province. The latter part of the season of 1915 being wet, gave the new seeding an excellent start and the scarcity of farm labour has increased the acreage seeded down. The honey market in Canada seems to be practically bare at present, and dealers are already contracting for 1916 crops at advanced prices. The scarcity of sugar assures a good market for a large crop of honey.

MANITOBA

NOTES

RURAL SURVEY IN MANITOBA

Mr. R. W. Murchie, of the Manitoba Agricultural College, has commenced work on a rural survey that will be undertaken in certain districts of Manitoba. Data will be collected not only in regard to agricultural conditions, but also in connection with the homes, schools and social life. It is hoped that the information carefully gleaned at first hand may be very valuable as indicating just what are the strong and weak points in our rural system, and in helping the College workers to adapt their message to conditions as they exist.

WEEDS COMMISSION ACTIVE

The members of the Manitoba Weeds Commission have now met about 60 of the municipal councils of Manitoba while in session and have explained to them the new provincial Noxious Weeds Act, enlisting their co-operation in its enforcement. They have been asked in many cases to advise as to the type of men to appoint as local inspectors, and have advocated the selection of men of mature years and sound judgment, who understand farming and are able to identify the principal weeds and suggest methods of eradication.

Where possible, the weed inspectors appointed have been conferred with, and both to the councils and inspectors it has been strongly represented that in every case where the farmer is trying to keep his weeds under control he shall be given all possible consideration and assistance, while at the same time the provisions of the Act must be carried out. By May 8th the appointment of the inspectors in over 90 municipalities was reported, and added notifications were daily being received by the commission. Each inspector is being supplied with information on weeds, and a circular suggesting how the Act is to be applied.

Hon. Mr. Winkler has agreed that a series of conferences should be held in several representative centres, at each of which the weed inspectors of that part of the province will gather. At these conferences practical field work in weed eradication will be carried on, instruction given in methods of eradication, and the Act fully explained in all its details. Not only will these conferences be open to local inspectors, but also to all farmers who care to attend. It is a particularly hopeful sign that the local inspectors themselves have asked for these conferences, showing their interest in their work. The Commission is confident that the staff which the province will this year have at work on weed suppression will be vastly superior in efficiency to that ever previously employed on this work.

Two important classes of persons have been visited personally by Prof. Bedford and other members of the Commission. These are the officials of all railways running through the province and the councils of many of the cities and towns. In the past the railroad right-of-way and town subdivisions have sometimes been prolific sources of weed distribution. Already several large breeding spots for very bad weeds have been discovered in different parts of Manitoba. On these, seeds have been ripening to scatter about the country and grow on farms. In most cases those in authority have promised the Commission all help possible.

FARMERS' WIVES ASKED TO PLAN FARM HOUSES

There are many farmers' wives who have some excellent ideas in regard to how country houses should be planned so as to be most convenient and practical. Yet, in the face of this fact, there has always been a dearth of ready prepared and complete plans of farm houses that are happily adapted to the farm conditions of this country. The trouble has been that the ideas of the country women in regard to details and the professional skill of the

architect who will take these ideas and incorporate them into a set of finished plans have never been brought together.

The Manitoba Agricultural College is seeking to remedy this defect, and in order to do so has instituted a Better Farm Homes competition. Five prizes, each of the value of \$25, are offered to Manitoba women who are members of the Home Economics Societies, or who are living or have lived on the farm. These prizes are for the best ideas in farm house planning. In order to assist the contestants to present their ideas clearly, cross-section paper will be furnished free to each contestant; also a sample drawing will be sent.

When the women's plans are all in, the College staff will compile plans of farm homes in which will be incorporated the ideas that the women have furnished.

The whole scheme is planned so as to demand no previous skill in drawing on the part of contestants; the competition is not in draughtsmanship but rather in ideas.

MANITOBA CHEESE FACTORIES BUSY

Manitoba will have three new cheese factories in operation this season, situated at Haywood, Lorette, and Toutes Aides. This brings the number in the province up to a total of 25.

One effect of the war has been to create a keen demand for eastern Canadian cheese, and this has resulted in a considerable advance in price. For some years previous to the war the average price for Manitoba-made cheese was 13 cents. Already some of the Manitoba factories have sold part of this season's make at 18¼ cents.

Most of the cheese factory patrons ship their milk to Winnipeg during the winter to supply the city milk trade. About April 1st, they began this year to make cheese.

Mr. I. Villeneuve, who inspects the cheese factories under direction of Dairy Commissioner Mitchell, reports a very satisfactory improvement, not only in the quality of the cheese made, but also in the class of the cattle kept in these districts. During recent years two or three pure-bred bulls, mostly of the Holstein breed, have been introduced into each district, and the farmers are also giving their cows better feeding and care.

In five cases the factories have doubled their cheese output during the past two years, and in some cases even a better record has been made.

Three of the Manitoba cheese factories are in Mennonite settlements. The remainder are all in French districts.

One of the most popular classes of short course offered by the Manitoba Agricultural College is that in steam and gas engineering. The ninth annual course on these subjects will be held at the College from June 13th to July 1st.

George Jones, B.S.A., who for three years has been assistant superintendent of demonstration farms for the province of Manitoba, resigned at the end of March to take charge of his own farm at Carman, Man.

Dr. G. W. Morden, Professor of Chemistry at the Manitoba Agricultural College, has been appointed to the position of head chemist to a section of the Imperial Munitions Commission in England. Dr. Morden, having studied and lived for many years in Germany, and speaking the language well, may also be able to render assistance to the Imperial authorities in other capacities than the one to which he has been appointed.

ALBERTA

BETTER FARMING TRAIN

BY H. A. CRAIG, DEPUTY MINISTER OF AGRICULTURE

IT is the intention of this Department to run a Demonstration Train during the months of July and August as was done last year.

The itinerary will be as wide as the province as was the case last year, but the same points will not be visited. On the north the train will go to the Peace River.

The same departments of work will be represented in lectures and exhibits as last year. These include—live stock, dairy, poultry, farm buildings and equipment, demonstration farms, agricultural schools, game preservation, weed and seed work, veterinary work and domestic science.

While the live stock work will be a

strong educational feature as usual, it is the purpose of the Department to accentuate to the fullest extent possible the activity of dairying, which has shown such substantial expansion during the past year.

The Women's Department likewise is becoming more important. Women's organizations have almost trebled in the province during the year. The lecture work and equipment in matters relating to house-keeping and homemaking will be as complete as possible.

The work of the agricultural schools will be fully explained and illustrated. Fundamental cultivation and fodder production will receive suitable emphasis.

The Manitoba Department of Agriculture and Immigration has perfected arrangements whereby owners of farm lands within the province may list these properties for sale in all the immigration and colonization offices under the direction of the Manitoba government. The Department, through its immigration and colonization headquarters at 439 Main Street, Winnipeg, is prepared to supply to land owners, free of charge, all necessary blank forms for the owner to fill out. Arrangements will then be made to direct or accompany the land seeker to the locality where the land is situated, or in other suitable manner to give him all necessary information.

PART III

Rural Science

SUMMER SCHOOLS FOR TEACHERS

PRINCE EDWARD ISLAND

ARRANGEMENTS are being made to have a Summer School for Teachers at Prince of Wales College beginning July 31st and ending August 11th. The teachers already engaged are: Pro-

fessor McCready, of Prince of Wales College, Charlottetown, Superintendent Fuller of Old Town, Maine, and Miss Hackett, Supervisor of Drawing in the Boston schools.

NOVA SCOTIA

BY L. A. DEWOLFE, B.A., DIRECTOR OF RURAL SCIENCE SCHOOLS

THE next session of the Rural Science Training School will be held in Truro, N.S., July 12th to August 10th.

The school is under the affiliation of the Normal and Agricultural Colleges. Instruction is given in botany, biology, horticulture, na-

ture study, agriculture, chemistry, zoology, entomology, ornithology, physics, bacteriology, geology and manual training.

Graduates of the Normal College may qualify for a Rural Science Diploma in two summer sessions. Others require three sessions.

NEW BRUNSWICK

BY R. P. STEEVES, M.A., DIRECTOR OF ELEMENTARY AGRICULTURAL EDUCATION

THE Departments of Agriculture and Education in New Brunswick are co-operating to conduct two Rural Science schools for public school teachers this year, one at Woodstock, in the Fisher Vocational School and one in the Agricultural School at Sussex. The session will last four weeks from July 5th to August 2nd. Appropriate closing exercises will be held during the last two days.

The same general principles that governed in the schools of the last two years will continue in evidence. It is the wish of both Departments that these schools shall give such instruction to teachers as will enable them in their own class rooms to deal effectively with the prescribed nature study and agriculture course. Instead of in the animal life section dwelling on the minute forms following strictly scientific

lines as in a college course, domestic animals in their relation to economic and industrial conditions in the province, insects beneficial and injurious to man, birds and wild animals, will figure more prominently. A more earnest attempt will be made to closely co-ordinate and correlate the work of all sections with a view of securing greater educational value. At the same time every attention will be given to utilizing local conditions as school units, to fixing the school's place in creating and developing community sentiment, to using the life of the present to promote culture and inculcate high ideals of citizenship.

Several of last year's instructors have been re-engaged. Among those already selected for the staff are: H. H. Hagerman, M.A., H. E. Bigelow, Ph.D., Soil and Inorganic Nature; J. E. McLarty, B.S.A., and A. M. McDermott, B.S.A., Plant Life and School Gardening; Wm. McIntosh and Inspector F. A. Dixon, M.A., Animal Life; F. Peacock, B.A., R. J. Murray and Miss Jean Peacock, Manual Training and Rural Domestic Science.

It is expected that several short courses in special subjects will also be given. Among these will be milk-testing, poultry, plant diseases and soil fertility.

Arrangements are being made to have illustrated lectures by prominent workers from outside the province. Some of such speakers are Dr. C. H. Lane, Chief Specialist in Rural Education, Washington, D.C., V. E. Kilpatrick, President School Garden Association of America, New York, and Dr. C. C. James, Dominion Commissioner for Agriculture, who has written that if his official engagements permit he will pay the schools a visit and address the students.

Garden and experimental plots are being put in this spring, so that the students may have close at hand opportunities for daily observation and study, and for practice in cultivation. Open spaces are being prepared so that the students under trained instructors can prepare ground and plant seeds and tend the young plants as they grow up.

Applications are coming in and the enrolment list is steadily growing.

ONTARIO

BY J. B. DANDENO, INSPECTOR OF ELEMENTARY AGRICULTURAL CLASSES

THE Department of Education of Ontario in co-operation with the Agricultural College at Guelph provides for a course of instruction in Elementary Agriculture and Horticulture for teachers for both Public Schools (including Separate Schools) and High Schools.

The elementary course extends over two summers of five weeks each and is intended to equip teachers for the rural schools. The intermediate course also includes two summer sessions and provides a programme suitable to the needs of the high school teachers. Both the elementary and the intermediate

courses are made as practical and as useful as possible.

The session commences on July 3rd and closes August 4th. Students should present themselves for admission not later than the morning of July 3rd.

Courses are now offered in Farm Mechanics at Guelph with a view towards training teachers for work as outlined in the announcement concerning Departments of Agriculture and Household Science for high schools.

Teachers have no tuition fee to pay, and are practically at no expense.

MANITOBA

THE summer school for teachers will be held at the Kelvin Technical High School, Winnipeg, from July 4th to August 4th, 1916. Five courses are provided, namely:—

1. Elementary agriculture, school gardening, and nature study, including (a) elementary course for beginners, open to all teachers; (b) advanced course, open to those who have already taken the elementary course or its equivalent elsewhere.

2. Arts and handicrafts, including: architectural drawing; blacksmithing; clay-modelling and pottery; domestic science; drawing, design, and basketry; household arts; wood carving, and woodwork con-

struction.

3. Social and playground work, including folk dancing.

4. Physical training.

5. French for teachers in secondary schools—July 4th-21st.

The course in elementary agriculture, nature study, and school gardening is compulsory for all teachers from points outside of Manitoba who have obtained interim second class standing, before they can obtain a permanent certificate. All of the courses are open to any teacher of the province who wishes to become more proficient.

SASKATCHEWAN

THE summer school for teachers under the direction of the Department of Education will be held at the University of Saskatchewan, Saskatoon, from July 3rd to July 28th, 1916. Six courses are provided, namely: First and second year courses in agriculture and elementary science; first and second year courses in household science; a course in physical training, and a special course in agricul-

ture and science; the latter will be held from July 10th to 28th.

At the conclusion of the courses, diplomas will be issued only to those who hold teachers' certificates from the Department of Education for Saskatchewan.

The only fee is a laboratory fee of \$1.50, which must be paid by all teachers taking the experimental or laboratory work.

ALBERTA

THE summer school for teachers will be held at the University of Alberta, Edmonton, from July 3rd to August 5th, 1916. As the enrolment must of necessity be limited, applications were required to be filed before May 30th, and registration must be completed not later than July 4th. The school provides instruction in eight courses. The successful student in any one or more of the courses is granted a certificate. The courses are as follows: Elementary science; elementary household arts; elementary art; elementary manual arts; elementary woodwork; physical training; folk

dancing and musical games, and first aid and home nursing. Special courses for teachers of science and agriculture in high schools are arranged to be held simultaneously with the school for teachers. For those teachers who were unable to attend last year the courses, methods in botany, methods in zoology, and high school agriculture course 1, are provided. For those who were in attendance last year and who are able to attend this year the courses, methods in chemistry, methods in physics and high school agriculture, course 11 are provided.

PRINCE EDWARD ISLAND

THE HOUSEHOLD SCIENCE SHORT COURSES

BY MISS HAZEL STERNS, SUPERVISOR OF WOMEN'S INSTITUTES

THE Department of Agriculture, Prince Edward Island, conducted during the months of January, February and March, six short courses in household science. These classes were held at the Prince of Wales College, Charlottetown, and were under the direction of Miss Hazel L. Sterns, Supervisor of Women's Institutes.

Upwards of three hundred and fifty applications were received from the women and girls of the rural sections of the province. As there was

accommodation for only 26 in a class there are still a number of applicants on the waiting list.

Lectures were given on various subjects of special interest to the homemaker on the farm, while all had the opportunity of carrying on the practical work in the cooking classes, as well as in the laundry work, home nursing, table setting, millinery, flower making and stencilling.

The following subjects were dealt with:



STUDENTS OF ONE HOUSEHOLD SCIENCE SHORT COURSE HELD AT CHARLOTTETOWN, P.E.I.

Cooking..	Miss Sterns.
Laundry	
Home Nursing	
Home Management	Miss Macfarlane
House Furnishings	
Kitchen Equipment	
Millinery.....	
Flower Making.	
Table Setting..	Miss Gordon
Hygiene.....	
Preparation of School Luncheons	
Care of Milk on the Farm.....	W. R. Reek, B.S.A.
Poultry.....	W. Kerr, B.S.A.
Improvement of the Home Grounds.....	J. A. Clarke, B.S.A.
Farm Home Conveniences.....	Theodore Ross, B.A.
Vegetable Gardening.....	J. Leslie Tennant, B.S.A.
School Improvement.....	Prof. McCready.
Prevention and Treatment of Tuberculosis.....	Dr. Garrison.

PART IV

Special Contributions, Reports of Agricultural Organizations, Notes and Publications

THE PRESERVATION OF BIRD LIFE

IN connection with the article on "The Preservation of Bird Life" in the May number of THE AGRICULTURAL GAZETTE, page 472, it is interesting to note that the practice of holding bird box exhibitions and contests is spreading. It is also interesting to note that these affairs are invariably accompanied by lectures and addresses, not only on the human phase of the subject, but also on the value of the birds and the good work they do in the repression of insect pests. Touching upon this an article entitled "Some Common Birds Useful to The Farmer", by F. E. L. Beal, Assistant Biologist in the United States Department of Agriculture, appeared in the August, 1915, number of the Bulletin of Foreign Agricultural Intelligence, from which the statistics were taken that follow, showing the percentage of insects constituting the food of fifteen more or less common birds as proven by examination of the contents of their stomachs:

BIRD	Number of Stomachs Examined	Percentage of Insect Food	Percentage of Other Food
Blue bird	855	68	32
Robin	1236	42	58
Chickadee	289	68	32
Wren	88	98	2
Brown thrasher	636	64	36
Catbird	645	44	56
The grackles	2346	30	70
Brewer blackbird	312	32	68
Baltimore oriole	204	84	16
Bullock oriole	162	79	21
Meadow lark	1514	74	26
Red-winged blackbirds	1083	26	74
Crow	1103	20	80
Blue jay	530	22	78
Say phoebe	86	98	2

Various varieties of sparrows, king-birds, woodpeckers and the cuckoo were also shown in the investigations that were

carried on to be insectivorous, but the percentages regarding them were not given. It should be explained that the "other food" referred to in the table does not of necessity mean grain or cultivated fruit, but more often than not has reference to weed seeds and wild berries. The percentage of grain consumed by any of them, except possibly the crow, is shown to be very small.

BIRD BOX COMPETITION AT BROCKVILLE

A campaign for the conservation of bird life has been instituted at Brockville, Ont. It is being carried on in connection with the "Community Movement", of which Mr. W. H. Wood is secretary. The campaign was initiated by an address on bird life, delivered by Dr. C. Gordon Hewitt, Dominion Entomologist. It included a bird box building contest and exhibition for boys, which was held April 28th, and the exhibits, numbering over a hundred, were of a varied character, showing considerable ingenuity and not a little architectural ability, mostly of a rustic nature. There were single-roomed houses and apartment houses, one built for the martin family consisting of no fewer than 23 rooms. Nineteen prizes were awarded, comprising bird books, coloured plates of birds, bird pins, etc. Entries were free and the boys entered with zest into the spirit of the praiseworthy, instructive undertaking. The local newspapers heartily lent their aid towards creating interest in the exhibition and contest. One of them, besides publishing the prize list in full, devoting a page to describing the insectivorous birds, their natures, habits and methods of living, such as those mentioned in the table given above.

EXHIBITION AND SALE AT HAMILTON

A similar exhibition and contest to that held at Brockville took place at Hamilton,

Ont., on April 6th, by the boys in manual training at the Strathcona and Caroline street schools.

After being judged the bird houses, numbering about two hundred, were displayed in the windows of one of the largest stores in the city. The firm included a notice of the display in their newspaper advertising. The display attracted great attention. In addition to cash prizes,

Horticultural Society, the final one being given on April 26th, by the Rev. G. W. Tebbs, president of the Ontario Horticultural Association, when the prizes won by the boys at the bird-box competition were awarded. Mr. Tebbs took for the title of his address "Around my Garden with a Camera", and urged the beautification of the city and the cultivation of back-yards and vacant places. He also



BIRD HOUSE SECTION OF GARDEN ARTS AND CRAFTS EXHIBITION OF THE
HORTICULTURAL SOCIETY, HAMILTON, ONTARIO

diplomas of merit were awarded to the successful competitors. A number of the boys of the Caroline street school sold their houses, the first prize house bringing eight dollars. The proceeds of the sale amounted to \$41.90, which was contributed to the Red Cross fund.

A series of lectures on bird life and gardening were also given during the winter season, under the auspices of the Hamilton

spoke appreciatively of the work of the Hamilton technical school in encouraging the pupils to build bird boxes, and to take an interest in the conservation of bird life.

The chairman of the meeting announced that the next meeting of the Horticultural Society would take place in Dr. Clark's tulip garden at Grimsby, which contains 60,000 tulips, being the most extensive tulip display in Canada.

VACANT LOT GARDENS IN OTTAWA

BY W. T. MACOUN, CHAIRMAN, CHURCH COMMITTEE, ST. ANDREW'S CHURCH

DURING the summer of 1915 vacant lot gardening was carried on in Ottawa on what is known as the Glebe property, owned by St. Andrew's Church of the city. The land, which was all in one block, was ploughed, thoroughly harrowed, and then divided into 128 plots, each 50 by 100 feet. The number of applicants far exceeded the number of plots, and great success attended the whole effort.

PLANS FOR 1916

This year the committee in charge of the St. Andrew's Church Glebe Gardens is not ploughing the land, but each gardener is preparing it the way which suits him best. All the expenditure the committee is likely to incur is what may be necessary to keep the roads and paths in good order.

The plots were practically all allotted before May 1st this year, and the prospects are good for a very successful season.

Three adjacent plots have been granted to the public schools for school gardens, on one of which it is proposed to grow flowers for the hospitals.

The use of vacant land for garden plots should commend itself to church workers all over Canada. Even though a church

did not own any vacant land, it is believed that many church members would subscribe enough to break up and prepare a plot, knowing that they would see good results from their gift. All that is needed is an enthusiastic church committee to organize the work.

SOCIETIES AND ASSOCIATIONS

THE ALBERTA HORSE BREEDERS' ASSOCIATION

The officers of the Alberta Horse Breeders' Association elected at the annual meeting held in Calgary are as follows: President, Geo. Lane, 1st vice-

president, Dr. J. G. Rutherford, 2nd vice-president, Geo. Hoadley, M.P.P., secretary, E. L. Richardson, Calgary.

THE NEW SYSTEM OF PRIZE AWARDING

The new system introduced into Calgary, Alberta, by Secretary E. L. Richardson, of distributing prizes in each class according to the number of entries was tried out at the recent spring horse show and was found to work so well that it is felt, if equally successful at the coming summer exhibition, its advantages will have been so completely proven that general adoption at fairs and exhibitions will follow. At the spring horse show, which was held in Calgary, April 13th, to

15th, the amount guaranteed to be paid in prizes was \$3,750, of which, together with special prizes, \$3,189 was won, leaving \$561 to be added to the premium. The number of prizes won was 263 and the amount to be added to each prize, including to reserve ribbon winners, was \$2.15. The \$3,750 paid in prizes this year was \$1,110 in excess of the money paid out in 1915. It is anticipated that the Association will be able to add yet another \$1,000 next year.

AUCTION SALE OF BULLS AT CALGARY, ALBERTA

THE auction sale of bulls conducted at Calgary, on April 12th, 1916, by the Alberta Live Stock Association, proved the most successful sale yet held by

that Association. The following table shows by comparison the prices received this year and last:

BREED	1916			1915	
	Number Sold	Amount Received	Average per Animal	Number Sold	Average per Animal
Shorthorn...	187	\$41,340	\$221.06	213	\$146.38
Hereford.....	81	25,195	311.04	86	196.04
Angus	34	5,975	175.73	30	154.50
Galloway.....	1	105	105.00	..	.....
Ayrshire.....	...	.....	.....	1	60.00
Holstein.....	...	.....	.....	6	78.33
Totals.....	303	\$72,675	\$239.77	336	\$158.79
				Total received, \$53,355.	

Total number of bulls sold by the association to date, 3,271.

Total receipts to date for bulls sold, \$410,902.

Average price for 3,271 bulls, \$126.

THE NATIONAL LIVE STOCK RECORDS BOARD

THE eleventh annual meeting of the National Live Stock Records Board was held in Toronto on Wednesday, May 10th, 1916. There was a fairly large attendance of representatives of the different breeds. Mr. William Smith, M.P., of Columbus, Ont., was in the chair. In his opening address he referred to the success achieved last year, stating that the receipts were \$69,731, and that if the remaining eight months of the present year corresponded with the first four months, the revenue in 1916 would very nearly double that of 1915. The four months had shown an increase of \$8,000 compared with the corresponding period of last year.

Considerable discussion followed regarding the method of electing the record committee. Resolutions were finally passed endorsing the proposition that the six members of the committee should be chosen by the Board at large, instead of, as formerly, by the breeds; approving the election of a vice-chairman and giving the committee power to fill vacancies caused by retirement or death.

SHORTAGE IN LIVE STOCK

The Live Stock Commissioner, Mr. John Bright, then addressed the meeting. He declared that the prospects for live stock breeders were never brighter. In horses the situation during the past two or three years had been dull, but it was improving and there was a likelihood of their becoming alarmingly scarce. Over 60,000 horses had gone from Canada for war purposes. Six thousand horses had gone West, via Winnipeg, this year and thousands had gone and were going to the United States. More were also being bought for the war. Prices had advanced within the last two months at a greater rate than ever before in a similar period. During the dull times farmers had stopped breeding. They needed to start again quickly. They should be urged to breed every suitable brood mare to the best sire available. Cattle, too, were becoming very short. Farmers were not breeding as they did twenty to thirty years ago. They needed to return to their former methods. The

country did not contain cattle suitable for the British market. There was plenty of feed but there was not the stock. Last fall 100,000 cattle went to the United States, principally from the West. They were not finished cattle but good grass cattle. The shippers did not find a successful market. The cattle were kept a short time and then shipped back, 10,000 carcasses a week, to Toronto, on the way to Europe, supplying a demand that we should have met when we had the feed here. A number of years ago trainloads of good steers could be had in several counties of Ontario. They could not be had to-day. Better bulls should be used and we should breed our own feeders.

SHEEP AND SWINE

Mr. Bright further said sheep were scarce and wool was high. Breeding sheep would prove a profitable industry. Turning to hogs he said that farmers are not supplying the needs of Canada. In January, February, March and April this year 367,000 hogs had come in from the United States. A year ago there were a lot of hogs in Canada, particularly in the West, but breeding was overdone and the packers took advantage of the situation with the result that depletion followed. Now when the market is high our neighbours to the South are supplying us and reaping the profit. The Live Stock Branch is doing all it can to remedy the state of affairs he had outlined. Literature was being distributed, pure-bred stock being sent out, assistance given to breeders, facilities for marketing improved and other steps taken.

THE RECORD COMMITTEE

The Record Committee was elected as follows:—Chairman, William Smith, M.P., Columbus, Ont.; representative for heavy horses, Peter White, K.C., Pembroke, Ont.; dairy cattle, W. F. Stephen, Huntington, Que.; beef cattle, Robert Miller, Stouffville, Ont.; light horses, Robert Ness, Howick, Que.; sheep, J. M. Gardhouse, Weston, Ont.; swine, J. E. Brethour, Burford, Ont.; secretary-treasurer, John W. Brant, Ottawa, Ont.

NEW PUBLICATIONS

THE DOMINION DEPARTMENT OF
AGRICULTURETHE DOMINION EXPERIMENTAL
FARMS

Seasonable Hints, Number 5, July 1916—This number, which covers July, August, September and October, comprises 16 pages and is a forewarning that on the work and care of this year, depends the nature and character of the crops in 1917. "Only very rarely indeed," says Director J. H. Grisdale, in bold type, "need any farmer have a really poor crop, much less a total crop failure, in Canada. The Canadian farmer who will do his work wisely and well each year and all the year round need seldom or never fear but that a crop fair to good at least, and usually excellent, will generously reward his every well-timed and well-planned effort." Advice and counsel are given, on live stock, by E. S. Archibald, Dominion Animal Husbandman; on when to cut grasses for hay, by Frank T. Shutt, Dominion Chemist and Assistant Director; on fruits, vegetables and flowers, by W. T. Macoun, Dominion Horticulturist; on field crops, by W. L. Graham, Assistant Field Husbandman; on poultry by F. C. Elford, Dominion Poultry Husbandman; on seed for next year's crops, by J. Adams, Assistant Dominion Botanist; on cereals, by C. E. Saunders, Dominion Cerealists; on field-root seed for next year, by M. O. Malte, Dominion Agrostologist; on bees, by F. W. L. Sladen, Dominion Apiarist, and on tobacco culture, by F. Charlan, Chief of the Tobacco Division.

THE HEALTH OF ANIMALS
BRANCH

Enterio-Hepatitis or Black-Head and the Biological Laboratory System of Raising Turkeys, by C. H. Higgins, V.S., Pathologist, constitutes Bulletin No. 19 of the Health of Animals Branch. The first part of this bulletin is devoted to a description of the disease, the losses from which have been enormous. From the information at hand it is believed that there is not a province in Canada free from this disease, and the increase in the price of this very desirable table bird can, in some measure, be attributed to the ravages of this disease. Owing to the great losses sustained, experimental work in the biological laboratory was begun, having as its ultimate object the restoration of the poultry industry. In this work the assistance of the Poultry Division of the Central Experimental Farm was secured and successful results were obtained. A description of the biological laboratory system of raising

turkeys concludes the bulletin. Experiments, so far conducted, indicate that best results are secured in rearing healthy stock if the eggs are artificially hatched in a reliable incubator and the poults brooded in a device that experience proves to be free from defects. The system described has been followed for a number of years and, while not perfect, provides a practical means of carrying turkeys through to maturity.

THE ENTOMOLOGICAL BRANCH

The Cabbage Root Maggot and its Control in Canada, by Arthur Gibson, Chief Assistant Entomologist, and R. C. Treherne, Field Officer. The subject of which it treats is very minutely dealt with in this 58-page Bulletin No. 12 of the Entomological Branch. Notes are also given on the imported Onion maggot and Seed-Corn maggot. In addition to the text, there are some thirty illustrations, showing the various stages of the pest, its methods of working, and the damage that it causes. In his introductory letter, the Chief Entomologist points out the importance of the matter by saying, that from year to year the loss caused by root maggots assumes greater proportions. From Nova Scotia to British Columbia and north to the Yukon, the injuries of the different species, but particularly of the Cabbage Root maggot, to roots and other fields and garden crops are reported, and, in many cases, the losses are considerable and discouraging. Years have been devoted to the study of the ways, depredations and best methods of repression of the evil. Results of the investigation carried on are minutely given in this bulletin, a careful perusal of which would benefit every vegetable grower. It is easy to believe that, as the author says, the loss caused by these insects in Canada amounts to many thousands of dollars. Not only cabbages and cauliflowers, but radishes, onions, beans and every species of root crop are preyed upon. Now is the time to be on guard, particularly after a moist season.

THE PROVINCIAL DEPARTMENTS
OF AGRICULTURE AND OF
EDUCATION

PRINCE EDWARD ISLAND

The School Circular; No. 1, February; No. 2, April, 1916; issued periodically under the auspices of the Department of Education, in the interest of education in general, but especially to promote rural science and other features of education meeting the needs of country life. No. 1, February, contains "Meanings of a Few

Educational Terms;" "How to Teach Rural Science;" "A Teacher's Experience," and "Announcements of Special Bonus awarded to Teachers for giving Instruction in Rural Science." No. 2, April, contains "What to Grow in School and Home Gardens;" "Suggestions for Conducting Children's Gardening;" "Suggestions for Rural School Improvements;" "How to Teach Rural Science Through Children's Gardening;" "Sale of Flower and Vegetable Seed to Schools," and "Sale of Grain, Potatoes and Eggs to Schools." Illustrations and diagrams are also given. The Rural Science Department, it might be mentioned, was organized by the Department of Education of the province, in September, 1915, with the assistance of the Island Department of Agriculture and by means of the funds made available by the Dominion AGRICULTURAL INSTRUCTION ACT. Two copies of the Circular are sent to every teacher in the province.

NOVA SCOTIA

Report of the Superintendent of Education. It is noteworthy that in this report, which is for the year ending July 31st, 1915, it is stated that the rural science work is carried on substantially by a grant amounting to \$9,868.43, for the year, from the Dominion Department of Agriculture, under the AGRICULTURAL INSTRUCTION ACT. The report states that the College of Agriculture, under Principal Cumming, is exercising a very stimulating influence on education in general through its close association with the Normal College at Truro. In his report, given in appendix B, referring to the Provincial College, Principal Cumming reports a decrease in attendance, owing to the war, but states that all the activities of the college are being continued with as much vigour as ever. Some of the graduates continue their studies either at Macdonald College, Quebec, or at the Ontario Agricultural College, but the majority return to their home farms at the end of the second year and are lending their influence to the uplift of agriculture in the Maritime Provinces. The short courses last year, were attended by 286 students, 57 of whom were women. The attendance this year was 255, 60 of whom were women. The decrease of men is entirely owing to the war. No other feature of the college work, says the principal, has been so stimulating to agriculture as the short courses. The Rural Science School has also made good progress, 159 teachers being present in July and August. The success achieved by the short course at the College of Agriculture, the report continues, led the staff to go one step nearer the farmer by holding short courses at several centers in the province. During 1915, five such courses were held, each being of three or four days' durations. An average attendance of 147

was attracted. A reference to the Women's Institutes states that there were 45 such organizations in the province at the time of the report, the main energies of which were at present devoted to war work. The sum of \$7,970.32 has been contributed to the Red Cross fund and \$692.67 to the relief of the Belgians, besides 162 boxes of goods and an ambulance that cost \$1,500. In addition to the instruction which the members of the college staff give to the student in the Rural Science school arrangements have been made this year by which twice each week agricultural lectures will be delivered to Normal College students. Imported seed, settings of eggs, and other agricultural material are supplied by the college to school children. A good deal of attention is given to domestic science and technical teaching, the entire report making a book of 206 pages.

NEW BRUNSWICK

Education for Country Life. An address given at the Teachers' Short Courses at Sussex, N.B., January 5th, 1916, by Professor S. B. McCready, of the Rural Science Department, Prince of Wales College, Charlottetown.

QUEBEC.

Report of Roads Department, 1915.—Good roads have always been recognized as necessary to the progress of a community, but it has only been within the last quarter of a century that the subject has assumed the attention its importance warrants. That the province of Quebec is actively promoting road improvement is proven by the annual report just published by order of the provincial legislature. With the aid of maps, illustrations and tables, the report, in its 98 pages, gives plentiful details of the work that has been done.

Report of the Official Laboratory, 1915.—Mr. A. T. Charron, Chief Chemist of the Provincial Department of Agriculture, and Director of the Laboratory, as an evidence that his work is appreciated by the public, states that he received over 800 letters during the year and mailed 940. He also analyzed 148 samples of food-stuffs, fertilizers, soils and seeds. The report, which covers 29 pages, gives details of the results of these analyses. The importance of not only clear, but absolutely pure, water, and cleanliness in the manufacture of food-stuffs, is strikingly illustrated.

MACDONALD COLLEGE, QUEBEC

The Analysis of Maple Products V and VI.—These are reprints from the Journal of Industrial and Engineering Chemistry for February and March, 1916. No. V is

"Miscellaneous Observations on Maple Syrup Incidental to a Search for New Methods of Detecting Adulteration," by J. F. Snell, and No. VI describes "A Volumetric Lead Subacetate Test for Purity of Maple Syrup," by J. F. Snell, N. C. Macfarlane and G. J. VanZooeren.

ONTARIO

Report of the Women's Institutes of the Province of Ontario, 1916. This publication is Part 2 of the yearly report and contains the list of summer meetings and speakers and their subjects.

Feeble-minded in Ontario.—The Inspector's tenth annual report on the feeble-minded in Ontario is a 50-page review, not alone of what has been done in the province, but also of the progress in care of this unfortunate class made in Britain and the United States. While an entirely satisfactory system of caring for the feeble-minded has not yet been developed, the evidence so far gathered would appear to favour the industrial farm colony on the cottage plan. Both children and adults are benefited by this system, while the state or municipality is to some extent relieved of the cost of their support by the proceeds of their labour.

The Monteith Demonstration Farm, 1915. The work done during last year is described in this 16-page illustrated report. It is stated that operations have been carried on in a practical way under field conditions. That the work is appreciated is proven by the fact that on the annual demonstration day, August 12th, 1500 people visited the farm. During the day 2500 lunches and six barrels of coffee were served free of charge. The weather conditions for the year were favourable and the yields of grain were heavy throughout Temiscaming. The pictures show the abundance of the crops. It is expected that each of five pure-bred Shorthorn cows kept on the farm will yield considerably over five thousand pounds of milk in a year.

An Outbreak of White Pine Blister Rust in Ontario, by J. E. Howitt, M.S.A., Professor of Botany, Ontario Agricultural College, and W. A. McCubbin, Dominion Field Laboratory of Plant Pathology, St. Catharines, Ontario, reprinted from *Phytopathology*, Vol. VI, No. 2, April, 1916. This article deals with the discovery of White Pine Blister Rust in 1914, and again in 1915, in currant plantations. Subsequent surveys, observations, and experimental work revealed the existence of Currant Rust, of which imported white pines have been clearly shown to be the source of infection, in nine counties of the province of Ontario. The results of spraying experi-

ments indicate that the rust on currants can be markedly reduced by repeated application of bordeaux mixture or soluble sulphur.

Agricultural Societies; Appendix to annual report, 1915. This is a full and complete record of the results of competitions in standing field crops and of the prize-winning grain at winter fairs and the Ottawa and Toronto exhibitions. The Superintendent in his introduction states that 1915 was the banner year for such competitions. Three hundred and eight crops were entered, being fifty more than in 1914. An important statement is that from a financial point of view the competitions surpassed all expectations, and that reports from prize winners are to the effect that in nearly every case largely increased prices were obtained by the sale of prize-winning grain. In some sections of the province, where the competitions have been specially successful, car-lots of seed grain have been shipped to farmers in the United States at remunerative figures. The report comprises 144 pages, the last eight being devoted to a record by districts of the principal weeds found in the fields of competitors.

A Troublesome Disease of Winter Tomatoes, by J. E. Howitt, M.S.A., and R. E. Stone, Department of Botany, Ontario Agricultural College, reprinted from *Phytopathology*, Vol. VI, No. 2, April, 1916. In this article the authors publish information relative to the discovery, in the spring of 1914, and again in 1915, of a disease seriously affecting tomatoes in forcing houses in the vicinity of Hamilton, London and Toronto, respectively. Careful, microscopic examination of the diseased plants, and plate culture tests having failed to disclose a causal organism, experiments were performed to determine if the origin of the disease was in the soil.

As a result of these experiments the authors concluded that as experiments in sterilized soil seem to indicate that the origin of the disease is in some way connected with the soil, but as no causal organism has been found, it would seem that the disease, which is widespread, and of which little is known, might be due to some chemical or physical deficiency in the soil, which is apparently overcome by sterilization.

Tenth Annual Report of the Horticultural Societies of Ontario, 1915, embodies the proceedings of the annual convention held in Toronto, November 10 and 11, 1915, together with brief reports from the various horticultural societies throughout the province. There are now 79 societies in good standing in the province with a membership of over 14,000.

It is worthy of note that many of the societies are taking an active interest in the work of interesting school pupils in the care and growing of plants, and in the preservation of bird-life. Numerous illustrations illustrate the scope, usefulness and success of much of the work undertaken. Among the many addresses delivered and printed in full are: Informal Planting of the Home Grounds, by Miss Mary Yates, Port Credit; Beautification of Country Homes and Rural Improvements, by R. A. Penhale, St. Thomas; Garden Roses, by Percival H. Mitchell, Toronto; Horticulture in Northern Ontario, by Mrs. Lorne McDougall, Haileybury; Notes on New Plants and Plants not well known, by Wm. Hunt, O.A.C., Guelph; Town Planning from a Horticultural Standpoint, by Thos. Adams, Conservation Commission, Ottawa; The History, Development and Propagation of the Lilac, by John Dunbar, Assistant Superintendent of Parks, Rochester, N.Y.; Common Sense in City Beautifying, by G. Wray Lemon, Secretary, Chamber of Commerce, Oil City, Pa. Other speakers were F. E. Buck, Central Experimental Farm, Ottawa, W. T. Macoun, Dominion Horticulturist, and W. Bert. Roadhouse, Deputy Minister of Agriculture for Ontario.

Vegetable Growers' Association. 1915.

There is a great deal of valuable and useful information comprised in the 100 pages comprising this report of the most successful convention yet held by the association. It was the eleventh annual gathering and the date was November 9th, 1915. A series of illustrations lend attraction and interest to the report, one of them being of the exhibit made by the Ottawa branch last fall and presented to the Orphans' Home. Among the interesting papers that are given verbatim are: "Fertilizers best suited for Vegetable Crops in Ontario," by B. Leslie Emslie, of the Division of Chemistry, Ottawa; "Vegetable Work at the Ontario Agricultural College", by J. E. Britton, B.S.A., O.A.C., Guelph; "Report on Experimental Work conducted at the Central Experimental Farm", by A. J. Logsdail, B.S.A., Assistant Horticulturist, Ottawa; "Report of Vegetable Specialist", by S. C. Johnston, B.S.A., Toronto, who shows that back-yard vegetable growing has but little effect on the market, and details results of a variety of investigations; "Tomato Blight", by D. H. Jones, Professor of Bacteriology, O.A.C.; "The Skinner System necessary for Successful Market Gardening," by Thomas Delworth, Weston; "Some Greenhouse Problems", by C. W. Waid, Lansing, Mich.; "Problems in Marketing", by Howard W. Selby, Philadelphia, Pa.; "Recent Experiments in the Control of Certain Vegetable and Field Crop Insects" by

Arthur Gibson, Chief Assistant Entomologist, Ottawa, and "The Vegetable Work at Vineland", by F. M. Clement, Jordan Harbour.

MANITOBA

Lightning Control, Extension Bulletin No. 1, by S. C. Lee, M.A., Professor of Physics, Manitoba Agricultural College. This bulletin of 27 pages, containing many instructive illustrations, constitutes No. 1 of Volume 1, of the Manitoba Farmers' Library, published monthly by the Department of Agriculture and Immigration. The subject of lightning control is dealt with from the standpoint of: Electric principles involved, efficiency in control of lightning, and care required in rodding farm buildings. A brief synopsis of important features precedes the bulletin proper, dealing with: Material, form of cable, arrangement, attachment, points, wire fencing, metallic roofs, inspection, installation and co-operation.

Agriculture and Immigration; Report of the Department for the fiscal year ending November 30th, 1915. Statistics given in this handsomely illustrated and printed 150-page report prove that agriculture has made marvellous progress in Manitoba during the past twenty years, as will be seen by the following figures:

	1896	1915
Yield of wheat . . . bush.	14,371,806	96,662,912
" " oats "	12,502,318	101,077,991
" " barley "	3,171,747	35,423,495
" " flax "	259,143	738,808
Value of butter . .	\$366,317	\$2,651,689
" " cheese "	450,213	2,760,697
Number of horses	95,140	329,994
" " cattle	40,507	631,005
" " sheep "	33,812	76,577
" " swine "	72,562	286,433

Besides details regarding agriculture there are given the reports of the Chief Game Warden and of the Publications Branch, a review of the immigration and labour situation, a number of sub-reports, particulars regarding the live stock associations, boys' and girls' clubs and competitions, extension work, home economic societies and expenditures on hospital and charitable account.

SASKATCHEWAN

Monthly Bank Bulletin Circulars have been issued by the Saskatchewan Department of Agriculture. The subjects dealt with in the April issue, are the Dairy Industry, Control of Noxious Weeds and Co-operative Marketing of Wool. The dairy circular points out the fact that the fifteen co-operative creameries operated by the Department of Agriculture provide a market for all the cream that the farmers of Saskatchewan can produce. The number of creameries in 1907 was four with 213 patrons and a total make of 66,246 pounds

of butter. In 1915, there were 15 creameries in operation, with 5,979 patrons and a total make of 2,012,410 pounds of butter. The noxious weeds circular outlines seven ways in which much may be done in the control of weeds. The third circular announces the intention of the Department to market the wool crop through the Co-operative Organization Branch.

BRITISH COLUMBIA

Boys and Girls' Competitions, 1916. Bulletin No. 70 of the Live Stock Branch of the provincial Department of Agriculture contains the rules and regulations governing the boys and girls' competitions for 1916, and the awards made in 1915.

Profitable Ducks is the title of Circular Bulletin No. 15, recently issued by the Live Stock Branch of the British Columbia Department of Agriculture and prepared by J. R. Terry, Chief Poultry Instructor. The circular gives specific directions for successful duck-rearing. The treatment of the subject begins with a description of the various breeds of ducks, and instructions are then furnished with regard to mating and breeding, hatching and rearing, feeding rations, shade and marketing.

Diseases and Pests of Cultivated Plants in British Columbia and their Control. Bulletin No. 68, of the Department of Agriculture, prepared by J. W. Eastham, B. Sc., Plant Pathologist and Entomologist, and Max H. Ruhmann, Assistant Entomologist. The opening pages of this timely and instructive bulletin are devoted to a general discussion of disease under the heads of non-parasitic diseases, parasitic diseases; fungi; bacteria and general methods of prevention. Then follows specific treatment of diseases affecting alfalfa, the apple, bean, beet, blackberry, celery, cherry, clover, corn, gooseberry, hollyhock, the oat, onion, peach, pear, plum, potato, quince, raspberry, rose, strawberry, wheat and tomato. Some sixteen pages deal with injurious insects, and the concluding chapter by B. Hoy, B.S.A., Assistant Horticulturist, deals with the subject of Sprays and Spraying.

Silos and Silage is Bulletin No. 66 of the Live Stock Branch, British Columbia Department of Agriculture, prepared by Wm. Newton, Soil and Crop Instructor. "The popularity of the silo in British Columbia is the foundation of a successful live stock industry. With the introduction of the silo, we will be able to feed our animals better and with greater economy. The digestive organs of animals that chew the cud are so formed as to require comparatively juicy and bulky food. The cow cannot thrive on exclusively dry feed so well as the horse. The nearest ideal food for the dairy cow is good pasture. This is

only available during the summer months. The best substitute during the period when pasture is not available is corn silage." With the foregoing paragraph, as introductory to the bulletin, and pointing out the value of silage to the British Columbia farmer, the justification for this timely bulletin seems complete. The author, within the scope of some 30 pages, points out valuable reasons for the growing of corn and its treatment as a silage crop. Details are then given re filling the silo. Numerous illustrations enhance the value of the matter contained relative to silos and their construction, their cost, capacity and value.

Public Schools Report, 1914-15—The Superintendent of Education of the province of British Columbia has embodied his report for the year 1914-15 in a rather bulky volume of nearly 500 pages, two-thirds of which, forming Part II, is devoted to very complete statistical returns. Part I comprises the General Report, by which it is shown that the total enrolment in all the colleges and schools during the year was 64,624, an increase of 2,361 over the previous year. Of the total 31,335 were girls and 33,289 boys. The grand aggregate of daily attendance was 10,258,668, an increase of 891,870. The average daily attendance was 52,821, an increase of 3,444. The percentage of regular attendance was 81.73, the highest in the history of the schools. The teachers numbered 1966, an increase of 107. Engaged in the colleges were 19, in the high schools, 132, in city graded schools 823, in rural municipality schools 474, and in rural assisted schools 518. Considerable space in the report is devoted to Elementary Agricultural Education and to the progress made in rural science and school gardening; a good deal of the particulars of which have been given in previous numbers of THE AGRICULTURAL GAZETTE. Some very pretty and appropriate illustrations accompany the text in both this section and in that dealing with manual training.

MISCELLANEOUS

Bird Houses Boys Can Build, by Albert F. Siepert, published by The Manual Art Press, Peoria, Ill. Here is a useful and particularly interesting 60-page booklet, designed to teach boys the joy of the companionship of birds as well as how to make every variety of bird-house. Many apt illustrations are given along with details of material needed, diagrams and measurements.

The Extension of Agricultural Production.—An address delivered by Dr. T. A. Brisson, at the Chambre de Commerce du District of Montreal, 18th and 25th November, 1914. In this address, the speaker, from

a realization of the great need for an increased production, makes a special plea for increased effort, more effective organization, better methods and a broadening of the idea permeating our agricultural education. Instances of intensive cultivation are cited to show the productive capabilities of the soil; the rural exodus and its reasons are dealt with. Under agricultural education, Dr. Brisson points out the usefulness of and need for school gardens, demonstration farms, and organization of agriculture, industrial and commercial. The address is published in English and in French, the two versions complete under one cover, comprising some 95 pages.

Veterinary Handbook and Visiting List, by Thos. B. Rogers, D.V.S. This is an exceedingly useful little book, 4½ inches by 7 inches, of convenient size for carrying in the coat pocket. The body of the work is devoted to prescription writing. A table is given of over 350 drugs with the proper bases, adjuvants, corrections and vehicles, and amounts for safe doses for the horse, the cow, the sheep, the calf or foal, the pig, the dog, and with notes upon variations. There is also a table of Latin phrases, giving their English translations and their technical abbreviations, a table of poisons and their antidotes, and half a dozen other tables of value to any one handling drugs. The book is not only a handbook, but a diary for veterinarians. The J. B. Lippincott Company, Philadelphia, are the publishers.

Canada, The Country of the Twentieth Century, by Watson Griffin, special Trade Commissioner; published by authority of Sir George E. Foster, K.C.M.G., Minister of Trade and Commerce. Mr. Griffin tells us that this exceptionally comprehensive and ably compiled and edited book of well-nigh 300 pages, with 10 maps of the country in whole and by provinces, and copious page and half-page engravings, was "prepared according to instructions for the purpose of giving business men who have never visited the Dominion, a comprehensive, but epitomized review of its agricultural, forest and mineral resources, its industrial and commercial development and its geographical relation to the

markets of the world." This extract from the introductory letter to the Minister sufficiently explains the scope of the work. There are seventeen chapters. The first is devoted to a general description of Canada and its resources and an outline of the reasons for terming it "The Country of the Twentieth Century". Chapter II under the heading "The Maritime Provinces and the World's Markets," tells of the resources and advantages of the Atlantic provinces for world-wide commerce. Newfoundland is included in this reference. The next four chapters deal with the advantages and opportunities of Prince Edward Island; Nova Scotia, which is in the same latitude as Italy; New Brunswick, which covers about the same area as Scotland, and the province of Quebec, with an area greater than that of Germany, Holland, Belgium, Denmark, Sweden, Austria-Hungary and Bulgaria combined. Chapter VII describes Canada's wonderful inland waterway, comprising the great lakes, the river St. Lawrence and the canal system, through which a direct route to the ocean is provided of 2,243 statute miles. Chapter VIII is monopolized by a geographical, topographical, geological, industrial and agricultural sketch of the province of Ontario, which in size about equals Germany and France combined, or fourteen of the principal states of the republic to the south. The latitude of the province is about the same as that extending from England to Italy, Toronto comparing with Florence, Hamilton with Marseilles and Moose Factory, St. James Bay, with the world's great metropolis—London. Chapters IX, X, XI and XII treat very fully of the Prairie Provinces, the North-West Territories, British Columbia and the Yukon. The character and extent of the succeeding chapters will be understood from the headings, which are as follows; XIII, The Fisheries of Canada; XIV, The Water Powers of Canada; XV, The Manufactures of Canada; XVI, Forest Products and Wood Manufactures; XVII and last, Farm Products and Food Manufactures. From this cursory survey it will be understood that the book is replete with valuable information on the illimitable resources, extensive area, unequalled attractiveness, and immense productive power of the Dominion in sections and as a whole.

NOTES

Announcement has been made by the Department of Agriculture of Ontario that the Short-Courses for judges of field crops and live stock will not be held this year.

Through the efforts of District Representative R. Schuyler, B.S.A., a Board of Agriculture was organized in the county of Brant, Ontario, with J. L. Clark, Cainsville, as president and Andrew Bate, Paris, as secretary.

A remarkable case of fecundity in a half-blood Hereford is reported by the *Journal of Heredity*. She was owned by a farmer in Benton County, Iowa. Herself a twin, born in June, 1909, in December, 1911, she dropped two calves, December, 1912, one, January, 1914, two, and in December, 1915, three.

There are 352 periodicals dealing with agriculture and rural sociology published in Russia. Of these 169 are published by agricultural societies and other social bodies, 92 by private persons or private institutions, 54 by Zemstvos and 37 by state institutions. There are also 41 publications partly agricultural.

Two new features of the prize list of the Spring Show to be held at Ormstown, Que., on June 7, 8 and 9, are the prizes offered for wool and the prizes offered the winners in the shearing competitions. Four prizes of \$7, \$5, \$3 and \$1.50 respectively are being offered for fleeces of wool under the classification of fine medium, medium, and coarse. Fleeces of Southern and the finest of Shropshire, Hampshire and Suffolk may be entered in the fine medium class. Coarser and crossbred or grade fleeces of above and Oxford, Dorsethorn and Cheviot may be entered in the medium class. Lincolns and Cotswolds will be shown in the coarse class.

Fleeces will be judged on preparation, rolling, tying, cleanness, shrinkage, uniformity, density, length and strength of fibre, brightness, crimp and softness.

Paint, twine and taglocks will be considered a disqualification.

A prize of \$10 is offered for the winner in the shearing competition and \$5 for second place. A special prize of \$5 is offered for the man who makes the neatest and best work in shearing.

The Ontario Department of Agriculture has made arrangements to hold a series of apiary demonstrations in different parts of the province. Mr. Morley Pettit, Provincial Apiarist, has the matter in hand. A specially trained practical bee-keeper is sent to take charge of the Demonstration and to handle the bees. Local bee-keepers are expected to assist. Hives are opened and the actual working of the bees explained. Often a queenless colony, or one preparing to swarm, serves as an object lesson. The Department attends to all the advertising and supplies the lecturer, so that the bee-keepers do not incur any expense.

The usefulness of the recent legislation enabling banks to loan to farmers on the security of their live stock, in the opinion of the *Monetary Times*, will likely be found, at first at least, in facilitating the complete preparation of cattle for market in Canada. Last year 50,000 feeders and stockers were shipped from the Canadian north-west, through Winnipeg to the United States, where farmers bought and finished them for market at a very substantial profit. It seems probable that the Canadian banker will now be able to help Canadian farmers, to a much greater degree than formerly, to reap this hitherto lost profit, by buying "feeders" and sending them to market in fully matured form.

"In Quebec, where rap strides in road improvement have been made in the last half-dozen years, 295 miles of water-bound macadam and 140 miles of gravelled roads were built in 1915 by the Government as provincial roads, or by municipalities with Government assistance, at a total cost of nearly \$3,000,000. The Sherbrooke-Derby Line Road, 32 miles is complete, there remain only 14 miles to be done on the Levis-Jackman Road, and of 32 miles of uncompleted road on the Montreal-Quebec road, foundation has been laid for 21 miles. These roads are expected to be finished this year. From 17,000 to 18,000 miles of earth, gravelled or macadam roads are regularly maintained by municipal councils, 476 municipalities having by-laws in force for road maintenance. During the past few years Quebec has expended over \$14,000,00 on its roads out of the \$15,000,000 appropriated. Several provincial roads asked for by different districts are receiving the Government's serious consideration."—*J. A. McNeil, Secretary, Dominion Good Roads' Association.*

INDEX TO PERIODICAL LITERATURE

- Eighty-two Bushels to the Acre, Clyde Alison Mann, *The Canada Monthly*, London, Ont., February, 1916, page 216.
- Bulletin of Foreign Agricultural Intelligence*, Department of Agriculture, Ottawa, Ont., March, 1916,
The Manufacture of Bread from Potatoes in Germany, page 214.
The Manufacture of Bread from Flour with Sugar Beets in Germany, page 215.
Co-operative Cattle-Rearing Societies in Switzerland, page 225.
- The Case of Spy, McIntosh & Co., Betty D. Thornley, *The Canada Monthly*, London, Ont., March, 1916, page 277.
- The Farmer's Advocate*, Winnipeg, Man., March 15, 1916.
The Science of Crop Rotation, by T. J. Harrison, B.S.A., Professor of Field Husbandry, Manitoba Agricultural College, page 375.
The Science of Plant Growth. Corn: A Lesson in Cross Breeding, by Prof. V. W. Jackson, Manitoba Agricultural College, page 383.
- Big Prices for Pedigree Live Stock, Anglo Scot, *Canadian Farm*, Toronto, March 24, 1916, page 4.
- The Canadian Countryman*, Toronto, March 25, 1916,
Bee-Keepers Solving the Labour Problem, by Morley Pettit, Provincial Apiarist, page 3.
When the Farmer Retires, by M. L. McBrien, page 7.
- Annual Report of the B.C. Consumers' League,
Mrs. J. C. Kemp, President of the League, *The British Columbia Consumers' Magazine*, Vancouver, B.C., April, 1916, page 3.
- The Farm and Ranch Review*, Calgary, Alta., April 5, 1916,
Fighting the Weed, Hon. W. R. Motherwell, Minister of Agriculture, Sask., page 241.
Rural Short Term Credit and Extension of Live Stock Husbandry, by the Editor, page 243.
- From Cream Can to Butter Box, *The Farmer's Advocate*, London, April 20, 1916, page 708.
- Breaking a Clay-Footed Idol—An Account of the Work of the Saskatchewan Grain Growers' Association contributed to the Farmer's Magazine by J. B. Musselman,
Prairie Farm and Home, Regina, Sask., April 12, 1916, page 2.
- Ontario's Horticultural Experiment Station,
The Farmers' Magazine, London, Ont., April 13, 1916, page 659.
- Stabilizing Farm Credits—What the United States is doing to Provide Cheaper Money,
The Saturday Press, Saskatoon, April 15, 1916, page 6.
- Varieties of Potatoes Suitable to N.B.,
W. W. Hubbard, Superintendent Dominion Experimental Station, Fredericton, *The Maritime Farmer*, Sussex, N.B., April 18, 1916, page 450.
- Caring for the Colts,
C. D. McGilvray, M.D.V., *The Grain Growers' Guide*, Winnipeg, April 19, 1916, page 30.
- Wheat and Flax Crops,
Prof. J. H. Grisdale, Director, Dominion Experimental Farms, *The Farm and Ranch Review*, Calgary, April 20, 1916, page 287.
- Spring Treatment of Stubble Land,
Prof. J. Bracken, Field Husbandry Department, Saskatchewan Agricultural College, *The Nor-West Farmer*, Winnipeg, April 20, page 443.
- The Banks and Small Depositors,
The Canadian Farm, Toronto, April 28, 1916, page 6.
- The Farmer's Magazine*, Toronto, May, 1916,
The Doukhobors in Canada: C. B. Sissons, page 14.
Canadian Farmers and Co-operation, H. Mitchell, page 23.
Laura Secord School: A Community Centre, Edna L. Ruley, page 26.
- From Portage to Automobile Road—What Canada has done, is doing and will do towards the securing of good and better roads,
E. A. Hughes, *Canada Monthly*, London, May, 1916, page 36.

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July, 1916

DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE

The Agricultural Gazette of Canada

EDITOR · J. B. SPENCER, B.S.A.

· Issued by direction of
THE HONOURABLE MARTIN BURRELL
Minister of Agriculture

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CONTENTS

	PAGE
Home School Gardens	589
The Late C. C. James	590

PART I

THE DOMINION DEPARTMENT OF AGRICULTURE

Accomplishments under The Agricultural Instruction Act	592
The Dominion Experimental Farms:—	
The Division of Apiculture:	
Results from Bees at the Dominion Experimental Farms in 1915, by F. W. L. Sladen	594
The Tobacco Division:	
Studies of Tobacco Soils in Canada, by H. A. Freeman	595
The Division of Animal Husbandry:	
The Ventilation of Live Stock Buildings	598
The Entomological Branch:—	
The March Fly (<i>Bibio abbreviatus</i>) in Grain Fields and as a Pest of Celery, by E. H. Strickland	600
The Fruit Branch:—	
Great Britain's Embargo on Fruit, by F. H. Grindley	603
The Seed Branch:—	
Paper Packet Seed Investigation, by E. D. Eddy	604
The Dairy and Cold Storage Branch:—	
Substitutes for Rennet in Cheese Making	607

PART II

THE PROVINCIAL DEPARTMENTS OF AGRICULTURE

Agriculture in Canada:—	
New Brunswick, by J. B. Daggett	609
The Ventilation of Live Stock Buildings:—	
Nova Scotia: The King System of Ventilation, by John M. Trueman	615
Quebec	618
The Ontario Agricultural College, by Prof. G. E. Day	618
Saskatchewan, by W. J. Rutherford	619
Nova Scotia:—	
Extension Work, by M. Cumming	622
Quebec:—	
The Industrial Farm System, by H. Nagant	623
Dairy Statistics for 1915, by G. E. Marquis	627
Ontario:—	
Rural School Fairs, by C. F. Bailey	629
Manitoba:—	
Notes	633

Saskatchewan:—	PAGE
Work of Co-operative Associations	634
Legislation Governing Cream Buying Stations	635
Alberta:—	
Extension Work, by H. A. Craig	635
Rural Highways, by J. D. Robertson	636

PART III

RURAL SCIENCE

Home School Gardens:—	
Prince Edward Island, by H. H. Shaw	638
Nova Scotia, by L. A. DeWolfe	639
New Brunswick, by R. P. Steeves	640
Quebec, by Jean Charles Magnan	641
Ontario: A Home Garden Contest, by C. F. Bailey	643
Manitoba, by H. W. Watson	644
Northern Saskatchewan, by Fred W. Bates	645
Southern Saskatchewan, by A. W. Cocks	646

PART IV

SPECIAL CONTRIBUTIONS, REPORTS OF AGRICULTURAL ORGANIZATIONS, NOTES AND PUBLICATIONS

Agricultural Research in Canada	648
Water Supplies and Sewage Disposal for Suburban and Farm Premises, by Peter H. Bryce	651
Agricultural College Graduates	654
Societies and Associations	656
New Publications	664
Notes	669
Index to Periodical Literature	673

The Agricultural Gazette

OF CANADA

VOL. III

JULY, 1916

No. 7

THE AGRICULTURAL GAZETTE of Canada is published monthly, in English and in French, by the Dominion Department of Agriculture. It is not intended for general circulation. A limited number of copies, however, are available to subscribers at \$1.00 per annum, or 10 cents per copy.

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HOME SCHOOL GARDENS

IT was a natural corollary that the spread of the school garden idea should lead to greater attention to the home garden. It would be almost impossible for the one to flourish without exercising an influence upon the other. The school garden, however, possesses this advantage that it sometimes reaches pupils at whose homes gardening is not encouraged even to the extent of a window flower pot. But where the home garden exists the school garden is of necessity a valuable auxiliary. This fact is abundantly proven in a series of articles from seven different provinces that appear in another section of this issue of THE AGRICULTURAL GAZETTE. In all these provinces encouragement is given in some shape or other, not only to school gardens, but to home gardens. In some cases the provincial Department of Agriculture has made arrangements for a supply of free seed; in others the municipality gives prizes for home garden exhibits at school fairs and fall exhibitions, and in others again, as in Ontario, the District Representatives have been authorized to organize home-garden contests. Thus there is evidence all over Canada not only of strenuous awakening in the general encouragement of agriculture, but also in the training and educating of children in the home and out of the home.

A teacher who does not follow up gardens at school with attention to the gardens at homes, says a Manitoba authority, fails to realize the purpose of the work and loses more than half the real pleasure and profit to be derived from it. There is undoubtedly a whole truth in this, but the benefits are not all to the teacher. They are mainly to the pupils themselves, to the parents, and through them to the whole community. It is pleasant, therefore, to be able to gather from the articles herewith published that not only are the school gardens increasing in number but that their influence is ever extending in greater proportion to the home; that the pupils are entering into the subject with constantly accelerated zest; that the teachers are taking pains to increase their knowledge of the soil and of plant life in order that they may extend their influence not only in the school but also in the home, and that a matter of vital importance to both country dweller and city dweller is gradually reaching its proper status all over the land.

THE LATE C. C. JAMES, C.M.G., M.A., LL.D., F.R.S.C.

BY the sudden death of Dr. C. C. James, Federal Commissioner of Agriculture, on June 24th, 1916, his many friends and the country generally have sustained a heavy loss, and a career of exceptional public usefulness has been suddenly terminated. Devoted to agriculture he was indefatigable in its service, and by his broad knowledge and tireless energy he contributed in an unusual degree to the betterment of the conditions of this great Canadian industry.

The deceased was a son of the late Charles James, J.P., who was of Irish descent, and of Ellen Caniff, who was of United Empire Loyalist parentage. Starting his education in Napanee he continued the training for his special career at Victoria College, then at Cobourg, where he graduated, taking the gold medal for Natural Science, and subsequently the degree of M.A. Later he accepted the professorship of Chemistry at the Ontario Agricultural College, holding that position for five years and taking a prominent part in securing the affiliation of the College to the University of Toronto.

In 1891 he was offered, and accepted, the Deputy Ministership of Agriculture for the province of Ontario, an office which he held for twenty-one years. His organizing ability and wide grasp of agricultural conditions resulted in greatly strengthening the work of the Department. One of the signal services rendered by him during that time was the establishment of the system of district representatives, whose work covers so wide and useful a field of activities at the present time.

In 1912 the Federal Government

having determined on a policy of greatly increased assistance to the provinces in agricultural educational work, the Honourable Martin Burrell Minister of Agriculture, decided to make a careful investigation of the existing conditions, and then work out a scheme which would make for a co-operative effort in a large way.



THE LATE DR. C. C. JAMES

Looking round for the best man for this investigational work he chose Dr. C. C. James and persuaded him to undertake the task. As a result came first the Agricultural Aid Act, by which half a million dollars was distributed amongst the provinces, and the following year the Agricultural Instruction Act, by which ten million dollars was set apart for

yearly grants to the provinces to be expended along lines indicated by the Act.

Dr. James' broad grasp of the whole situation was of great value in working out the general details of the new policy, and his zeal, ability and tact were equally valuable in the task which the Minister assigned to him of arranging year by year the agreements with the various provinces, which set forth the lines upon which these expenditures should be made. His reports of 1913-14 and 1914-15 set forth very fully what had been accomplished up to that time.

In other ways the late Dr. James's services were of great value to the Department. Entrusted with the direction of the "Patriotism and Production" campaign last year, and the "Production and Thrift" campaign this year, and also with

the editing and compiling of the "Agricultural War Book" he performed these tasks with the same ability and energy which characterized his other work, and his loss will be deeply felt by a host of agricultural workers throughout the country. He was not only a frequent contributor to the Press, but was author of a number of valuable books on agricultural and historical questions.

Dr. James was a member of the Board of Regents of Victoria College and of the Senate of the University of Toronto. In 1912 the last named conferred upon him the honorary degree of Doctor of Laws. He was also for a time President of the Ontario Historical Society, and was elected a Fellow of the Royal Society of Canada in 1905, and in 1911 he was made a Companion of the Order of St. Michael and St. George.

THE CALL OF CANADA

"The man who has fought for his country and for the highest human ideals will desire to settle down where he can best find the peaceful enjoyment of the ideals for which he has made sacrifices. The first thing that suggests itself is, that, as the British Empire has staked the very essence and life-blood of its existence, he should and will desire to live, and have his family live, and his descendants after him, in some part of the British Empire. An Empire that is worth fighting for is worth living in. Canada has given of her best for the Empire, and now, in 1916, she opens her doors to the Britisher as she did in 1816."—Dr. C. C. James.

PART I

Dominion Department of Agriculture

INFORMATION SUPPLIED BY OFFICIALS OF THE VARIOUS
BRANCHES REPRESENTED

ACCOMPLISHMENTS UNDER THE AGRICULTURAL INSTRUCTION ACT

THE annual report of the late Commissioner of Agriculture on the working of THE AGRICULTURAL INSTRUCTION ACT is a fair exposition of what the federal government is endeavouring to do for agricultural education. The aim from first to last is not only to benefit the farm industry, but to have the children trained so that they will love the land and exult in its produce; so that they will know how to get the most out of the soil and will take a pride in their achievement; so that they will know suitable from unsuitable ground; so that they will know good seed from bad seed; so that they will be judges of the best in creation, animal and plant; so that they shall have practical knowledge of the science of cultivation; in short so that they shall become good and wise husbandmen and valuable citizens. It is not proposed in the scheme of the Act that boys alone shall be the beneficiaries, for, as well as agriculture and gardening, household economics enter prominently into the plan of encouragement. How well the work is being done, and how the provinces are co-operating are set forth in this second annual report, being for 1914-1915, recently presented to Parliament by the late Commissioner of Agriculture for the Dominion.

PROGRESS IN RURAL SCHOOLS

Opening in a General Survey of the work that is being accomplished, incidental comparison is drawn between the progress that is being made in the United States and in Canada with agricultural instruction in rural schools, which is described as one of the pressing problems of the day. As it is only in recent years that the subject has received systematic attention, both with our neighbours and with ourselves, the ground had necessarily to be prepared by teaching the teachers. Hence, we are told in the report: "The work undertaken up to the present time has been entirely of a preparatory nature, consisting of the training of the teachers and the introduction of nature study and school gardening in the elementary schools. By what means instruction in the more advanced phases of such subjects is to be made generally available is the problem now confronting the educational authorities, and it is apparent that, under the present one-teacher system of schools, its solution is not easy."

AGRICULTURE AND DOMESTIC SCIENCE

The following is given as the summary of expenditure from grants

made under the Act by the different provinces for education in agriculture and domestic science in rural schools, including courses of training for teachers:

Ontario	\$21,045
Quebec	19,843
Nova Scotia	14,873
New Brunswick	14,258
Prince Edward Island	11,998
Saskatchewan (Domestic Science)	682
British Columbia	12,613

Total

\$95,812

BUILDINGS AND EQUIPMENT

Next the amount spent from the grants made under the Act for buildings and equipment are given as follows:

Ontario	\$195,818
Quebec	21,000
Alberta	18,380
Nova Scotia	55,230
New Brunswick	30,750
Prince Edward Island	12,275

Total

\$333,453

COLLEGES AND SCHOOLS

Upwards of a quarter of million dollars derived from the Act were spent in 1914-15 like this: Alberta, Schools of Agriculture (3) \$64,000; Saskatchewan, College of Agriculture \$56,148; Quebec, Macdonald Agricultural College, Oka Agricultural Institute, School of Agriculture at Ste. Anne de la Pocatière and minor institutions, \$118,850; Nova Scotia Agricultural College \$32,000 and Prince Edward Island, Prince of Wales' College, \$8,265; making a total of \$279,263. Thus we have spent in moneys derived from the Act in three directions alone no less a sum than \$708,028.

WOMEN'S WORK AND OTHER DIRECTIONS

Next we come to the expenditure on the home economics section (Women's Institutes, Home Economic societies and Homemakers' Clubs) and extension work in con-

nection therewith, and we find use of the federal subsidy has been made by half a dozen provinces in support thereof to the extent of \$39,392.

Other directions in which the funds were used in 1914-15 were for District Representatives, Ontario \$202,097, Quebec \$13,407 and Prince Edward Island \$6,166; for the encouragement of boys and girls' clubs under different classifications; short courses, on which the expenditure from the subsidy in three years has been \$48,076, and for instruction by demonstration in the same period \$545,575 by provinces as follows:

Ontario	\$ 44,900
Quebec	228,360
Manitoba	50,538
Saskatchewan	59,555
Alberta	32,160
British Columbia	63,143
Nova Scotia	22,168
New Brunswick	41,048
Prince Edward Island	3,643

Total

\$545,515

SPECIFIC EXPENDITURES

Following the "General Survey" the Report supplies by provinces particulars of the specific manner in which the allotments under the Act were used. Details of the allotments themselves in 1914-15 were given in THE AGRICULTURAL GAZETTE, Vol. 1, pages 35 to 38. It is hardly necessary, therefore, to say anything more in this connection than that while the applications of the funds in the various provinces were not exactly alike, yet the money was always used in a manner calculated to forward the defined objects and to be of benefit in the advancement of agricultural education all the Dominion over. The fulness with which this information is given can be gathered from the fact that 125 pages of the report are devoted to it.

VETERINARY AND OTHER MATTERS

The manner in which the funds granted to the Ontario Veterinary

College and the School of Comparative Medicine and Veterinary Science of Montreal are expended is detailed and then come the appendices with contributions and extracts referring to rural school consolidation in the United States and the Canadian provinces, school instruction in agriculture, farm mechanics and home economics, the farmer demonstrator, operation of

the Smith-Lever Act in Oklahoma, County Agent work in the North and West, Women's Work and Women's Institutes, importance of the veterinary profession, agricultural teaching in Prince Edward Island, the number of students enrolled in 1915-16 at the agricultural colleges and schools and veterinary colleges and appointments by provinces under the Act.

THE DOMINION EXPERIMENTAL FARMS

THE DIVISION OF APICULTURE

RESULTS FROM BEES AT THE DOMINION EXPERIMENTAL FARMS IN 1915

BY F. W. L. SLADEN, DOMINION APIARIST

IN 1915 bees were kept at fourteen of the Dominion Experimental Farms. There were 194 colonies, spring count, an average of 14 colonies per apiary. Among the largest apiaries Ottawa had 58 colonies; St. Anne de la Pocatière, Que., 44 colonies, and Brandon, Man., came third with 28 colonies. The loss of colonies during the winter amounted to 9 per cent. The average selling price of the honey was 16½ cents per pound. Nappan showed the highest yield of honey per colony, spring count, namely 178.6 pounds. This was gathered mainly from alsike and white clover, and was valued at \$21.43. Lethbridge produced the highest value per colony, namely, \$31.59 for 175.5 pounds of honey, mainly from alfalfa, and \$7.50 for increase, total \$39.09. The quality of the honey varied from good to excellent, with the exception of a small quantity gathered in the spring at Ottawa, which was dark and unpalatable. For all the farms, the value of the average amount of honey produced per colony, spring count, was 64.4 pounds, and it sold for \$9.96. Including the value of the increase in bees the total produc-

tion per colony was \$11.21. These figures are satisfactory, and show that bee-keeping in Canada is very profitable. They would doubtless have been higher had not a colony or two been used for exhibition purposes at most of the farms. A still better showing may be expected when the men in charge of the bees, most of whom are now learning apiculture and spend most of their time at other work, have acquired more experience. The control of swarming is their principal difficulty; this is being overcome by systematic manipulation. The cost of a hive of bees averages about \$10, and the cost of maintenance, other than labour, consisting chiefly of the cost of comb foundation and sugar for autumn feeding, may be put at \$1 per colony a year. Allowing another \$1 for honey containers and incidental expenses, a profit in honey production of \$7.96 per colony, or nearly 80 per cent on the capital outlay, not allowing for labour, is shown. That bee-keeping is well worth the labour expended is shown by the fact that an experienced and active bee-keeper can easily attend to 200 colonies without hired help.

THE TOBACCO DIVISION

STUDIES OF TOBACCO SOILS IN CANADA

BY H. A. FREEMAN, INSPECTOR FOR ONTARIO

THE Tobacco Division is constantly receiving letters asking for information and advice in regard to the kind of tobacco which should be grown.

Climate and soil conditions should determine the kind of tobacco raised. While the tobacco plant readily adapts itself to a wide range of soils and climatic conditions, and can be grown on most any soil that produces wheat and corn, the flavour and quality of the leaf depend on the soil type and soil conditions. The industry has been very highly specialized and there is a demand for types of tobacco possessing certain qualities. A nondescript tobacco is not worth growing and should not be grown, as it lowers the price of the really good tobacco.

In order to render greater service to the tobacco industry, and to promote the growing of the best quality leaf, the Division has taken up studies along the following lines on the tobacco soils of Canada:

1. To make a close study of the physical composition of the soils now producing tobacco in Canada.
2. To keep as accurate records as it is possible to secure in inspection work, and from the farmer regarding the growth, yield, and quality of tobacco produced on these soils.
3. To make a close study of the chemical composition of the soils now producing tobacco.
4. To make a very close and detailed study of the physical and chemical composition of each plot on the tobacco experimental farms.
5. To make comparative studies of the effect on yield and quality of types of tobacco when manure is used and when a chemical fertilizer is used.
6. To make soil surveys as far as seems practical of any promising new or proposed tobacco districts.
7. To classify and map the tobacco soils that are now being utilized, and any new ones, as they are discovered, where

sufficient data is obtained to justify the classification and mapping.

Since the investigations made by the U. S. Bureau of Soils during the last fifteen years have shown the distribution of crops to be so dependent upon physical characteristics of soils and upon climate, it is readily seen that data regarding this phase of the soil is very necessary if we are to advise farmers with accuracy regarding soil questions. No doubt data secured in other places regarding tobacco soils will be very valuable, but before we can use such data with any degree of understanding we must know what we have in order to correlate or expect results. The physical analyses is recommended as most valuable for soil survey work. In fact it should form the basis of the survey because it alone takes account of those physical functions—the regulation of the water supply, and, therefore, the temperature, the air supply, ease of cultivation, and crop adaptation—that play so large a part in determining the value of the soil for the production of any crop.

The tobacco plant probably more than any other is localized according to climate and soil. Each distinct soil formation, aided by climatic conditions, gives peculiar qualities to the cured tobacco leaf as to texture, flavour, colour, and special fitness for varied uses and for different markets. The same soil often has the capacity of producing imperfectly all the classes of tobacco, but such soil is not found to be favourable for yielding the highest excellence in any one of the classes. So controlling is the character of soil that one part of a farm may produce the finest grade of tobacco, and the other part will grow the commonest article.

Previous investigational work has

shown very conclusively that it is possible to locate a soil that is adapted to the production of a certain type of tobacco by a study of the physical and chemical composition of the soil. The production of a very good cigar leaf tobacco in Texas is the result of such a survey. In a soil survey of the Connecticut Valley, soils were mapped as being adapted to produce certain qualities of leaf of the same variety of tobacco differing markedly in texture and colour. Practical results since secured by growers have shown the deductions of the investigators to be very valuable and in most instances correct. Experiments conducted by the Connecticut Station have also shown the value of a careful soil survey of any proposed tobacco districts.

For purposes of interpretation of results, correlations, and general utility it is very necessary to have all of the data possible regarding the yield and quality of crops on the soil under observation, systems of management, rotations, and type of farming. A record of the native vegetation is also very important wherever it is possible to ascertain what the native vegetation is or was. In the collection of samples, inspection work, and information from farmers, we believe that it will be possible to secure sufficient data of this kind, without extra expense, to make the work very valuable, and interesting to all concerned. A few abstract results as is well known is not a sufficient basis upon which to lay down very rigid rules, but they often give very valuable suggestions, which, when enlarged and amplified, give the desired results.

A study of the chemical properties of the soil will aid in the further correlation of soil and crop production, and physical analyses, and also in the fertilization of crops.

To fertilize any crop intelligently three things must be known: what the plant requires, what is deficient in the soil, and the best source of plant food to supply the deficiency.

Chemical analyses of the soil are an excellent help in determining these points. Also in interpreting physical analyses it is necessary to know the organic and calcium carbonate content of the soil, which chemical analyses give.

The object in studying the soil condition on each plot of the tobacco experimental farms hardly needs discussion. On many of these points fertilizer tests will be made. A full examination of the physical and chemical conditions of the soil should in all cases precede the application of fertilizers; such examination will at the same time serve to determine the uniformity of soil-conditions, which is of first importance to the cogency of fertilizer tests.

Soils about which precise information has been obtained by manurial and other trials should be very completely examined in order that they may serve as standards in the analyses of other soils from the same area.

Experiments made without any definite knowledge of the nature of the soil under trial are very often of little or no value. The multiplication of culture stations unaccompanied by soil research is found to be a delusive repetition of the same inconclusive, random experimenting since it takes into consideration only the climatic differences, but leaves out of consideration the potent factors of soil quality and soil valuation. Many culture stations mention the soil in such indefinite terms as clay loam, sediment land and the like, frequently not even with a statement of the depth and character of the subsoil, much less their geological derivations or correlations. Thus anyone not happening to be personally acquainted with the land in question would be wholly without definite data to correlate the results with his own case. It is quite obvious that even if only to make possible the identification of new lands with others that have already fallen under cultural experience, and can, there-

fore, afford useful indications to the farmer, a close physical and chemical characterization of lands should be made the special object of study by soil investigators.

In comparing various fertilizers on the yield and quality of tobacco an earnest effort will be made to interest the farmer sufficiently to have him make fertilizer tests on a small and inexpensive scale, the results of which may afterwards be put into effect on his entire land. It will be to apply on separate plots singly and conjointly the various plant foods. By comparison, the cultural results should at once determine which of the fertilizers can most advantageously be applied to the land. These tests of course often suffer from seasonal influences, inequality of soil conditions, failure to apply the fertilizer at the right time, as to require several seasons' trial to secure definite results.

In the soil survey work the soil type is the first thing to be found out. Then we can classify the soil. If an adequate knowledge of the soil type and the locality is had, it can readily be ascertained in what respects the soil differs from the type, and then from the known results of manurial and other trials on that type one can give the information wanted with a reasonable degree of accuracy; otherwise, the report can only be a matter of guess work.

In short, the farmers' question "How shall I fertilize, etc." can be satisfactorily answered, and the manurial trials fully interpreted, only when a complete soil survey has been made.

For this year's work on tobacco soils we have taken a number of soil samples from the bright tobacco districts of Kent and Essex counties, Ontario. Complete chemical and physical analyses of these soils are in

progress. Careful notes of the location, and appearance, fertilization, last year's crop of tobacco, etc., were secured. Notes on the crop, culture, etc., for this year will also be secured.

Very different crops of tobacco as to yield and quality were noted on farms of seemingly the same type of soil, but the physical and chemical analyses may show the soil to be very different. These differences are to be closely studied and followed up in order to determine their significance. Of course, farmers practice different methods of culture, etc., that often determine widely varying results, but these points are all to be carefully noted.

Samples of soil are to be taken on inspection trips to various localities and sent in for winter work, and any soils not growing tobacco, but having the appearance of being adapted to the crop, may be sampled for examination, as far as practical.

On the tobacco experimental farms all plots intended for fertilizer tests, and rotation experiments, are to be carefully examined.

A study of soils producing root rot as to acidity and alkalinity will be made.

A study will also be made on the station farms and on farms in the district, of varieties and soils producing them to see whether a variety seems better adapted to a particular soil type. Indications that such is true was noted in the bright tobacco district.

An effort will be made to locate a locality adapted to the production of Maryland tobacco.

Every effort will be made to enlarge the scope of the work, to keep in view the practical needs of the farmer, and to begin work on new problems as far as possible as they arise.

THE DIVISION OF ANIMAL HUSBANDRY

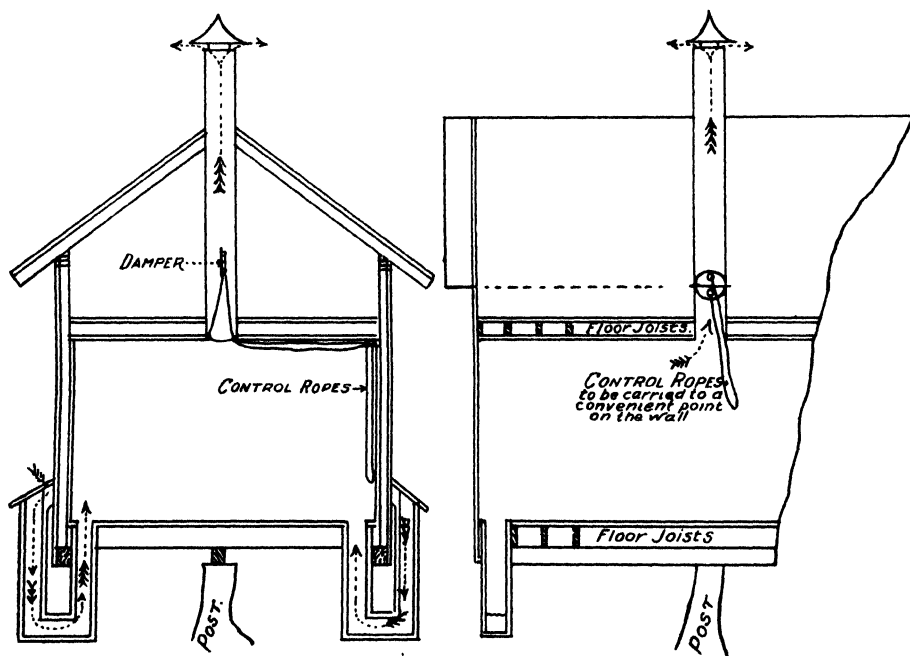
THE VENTILATION OF LIVE STOCK BUILDINGS

DURING the past ten or twelve years much experimental work in farm building ventilation has been carried on at the Central Experimental Farm. In Bulletin No. 78, of the Dominion Experimental Farms series, the results of these experiments and conclusions arrived at are set forth.

mental Farms from Charlottetown, P.E.I., to Agassiz, B.C., and has proven uniformly satisfactory and effective.

THE RUTHERFORD SYSTEM

The superiority of the Rutherford system, as proven by experiments and observations, is due to



THE RUTHERFORD SYSTEM OF VENTILATION

Cross sections, end and side views showing principle of the system

Many systems have shown more or less effectiveness, but of the thirty odd systems experimented with, the system commonly known as the Rutherford System of Ventilation has proven much superior. The Rutherford system of ventilation is now in operation in the barns and stables of all kinds on the Experi-

mental Farms, the chief being:

- (1) Ease in installation, in buildings old and new.
- (2) Adaptability to all classes of stables.
- (3) Suitability to variety of weather and climate.
- (4) Facility of operating and control.
- (5) Effectiveness in control of temperature in all parts of stable.
- (6) Cheapest to install, requiring less labour and less materials.

This system requires that the air enter at or near the floor level. When the air current enters the stable it has an upward direction, which it retains in some degree, but once free from the confining passage it spreads and as it warms gathers moisture and gases and rises to the ceiling, there to enter the lower end of the foul-air outlet. In the construction of this system it is advisable to avoid too many small outlets or too few and too large outlets. The small outlet has a poor draught and is easily choked, while the outlet too large for the volume of warm air allows down-draughts, condensation and poor ventilation. The outlet 24 x 24 inches, inside measurements, is an excellent size for medium-sized barns.

The fresh air intake requires careful consideration. The size of the intakes may be varied to suit the needs of the building. However, best results will usually be acquired where there are sufficient intakes to be evenly distributed about the four sides of the building. In the illustration, the inlets, it will be observed, enter the stable at the floor level. This inlet pipe is U-shaped and passes beneath the foundation wall. If the fresh air is taken from a covered shed the mouth outside may be near the ground level and be protected by a grating. If, however, the air has to be drawn from outside, more especially in districts subject to snow fall, the pipe should extend a considerable distance above ground, and the opening should be so arranged as to avoid the entrance of snow or rain, or undue influence from the wind. In the main barn at the Central Experimental Farm the roofed pipe is built against the wall, and the air enters through slots in the sides close to the building. Each intake, of which there are five, is 6 by 12 inches, giving 15 square inches per cow.

THE KING SYSTEM

The chief comparisons with the Rutherford system are:

- (1) More difficult to establish in old buildings.
- (2) More and longer flues required, which are more costly to install.
- (3) Not as adaptable to all classes of stables.
- (4) The foul-air chutes being next the wall, their roof must be very carefully insulated, or condensation will take place.
- (5) This system differs radically from the Rutherford system, as the foul air is drawn off at the floor.

The advocates of this system claim that carbonic acid gas is the chief impurity in the stable, and since the gas is heavier than pure air it is likely to be found in largest quantities near the floor. The best authorities on this system at the present time are inserting an outlet near the ceiling for constant use, and so regulating this damper that it can never be completely closed. This allows the taking off of the moisture and carbon dioxide from the upper air of the barn, and in this respect is but a modification of the Rutherford system. Undoubtedly this system may have the advantage of being able to maintain a somewhat higher temperature in the barn. From experiments in Canada, however, this is not sufficient to counterbalance the lack of purity in the air, except possibly in a few box-stall barns.

FOUL-AIR OUTLETS

These start at the floor level, follow the line of walls to the plate, and from thence to the peak or cupola or through the roof and up to the height of the peak. Advocates of this system usually advise special but rather expensive ventilator tops for the roof, which are not necessary in the Rutherford system. These foul-air outlets must be on both sides of the barn. Great difficulty will be found in installing and operating this system in any of the wider barns. There should be allowed 32 square inches per cow of foul-air outlet. The dampers must be installed at both floor and ceiling

levels to control the temperature and humidity.

FRESH-AIR INTAKES

These intakes are usually placed between the studs in the wall. The opening into this intake from out-of-doors is usually placed near the floor level. The fresh air is carried up between the studs to near the ceiling, where an opening is provided into the barn, with a control damper over the same. The fresh,

cold air falls, and in so doing must pass through the warm air. This causes a mixing of the air and the breaking of a natural course of air circulation, which is the second great reason why this system does not give as good satisfaction as the Rutherford system. In districts where extreme temperatures are not met this system may prove satisfactory. However, provision should be made for the same when erecting the building.

THE ENTOMOLOGICAL BRANCH

THE MARCH FLY (*BIBIO ABBREVIATUS*) IN GRAIN FIELDS AND AS A PEST OF CELERY

BY E. H. STRICKLAND, FIELD OFFICER IN CHARGE OF ENTOMOLOGICAL LABORATORY, LETHBRIDGE, ALTA.

IN the autumn of 1913 and of 1914, a large percentage of the celery plants grown on the Dominion Experimental Station at Lethbridge, Alta., were found to have been damaged extensively by the larvæ of the "March Fly", (*Bibio abbreviatus*).

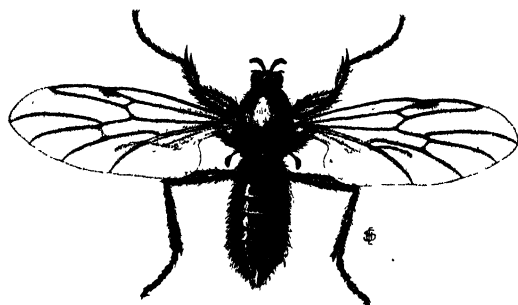


FIG. 1. THE MARCH FLY (*BIBIO ABBREVIATUS*), ENLARGED

This appears to be an exceptional feeding habit of these larvæ, for, though the complete history of this species had not been worked out, the most salient features of it under normal conditions seem to be as follows:

The larvæ feed for the most part

on decaying material. Where there has been a heavy application of dung manure to gardens, or to fields, there is a likelihood of these larvæ being found in immense numbers. They occur also in great numbers in places which contain rotting vegetation. Fields which have been recently broken, and which contain a quantity of decaying growth, such as the prairie-rose, are often found in spring to be so crowded with these larvæ that farmers are afraid to sow their grain on them.

The dates during which oviposition occurs are not known, and the early stages have not been seen here, but by the end of October all of the larvæ are full grown. It is in this condition that the winter is passed by the larvæ at a varying depth in the soil. In the celery beds most of them are nine or ten inches deep.

Early in April the larvæ begin to work their way upwards, and in most cases come right to the surface of the soil. In gardens they are in-

clined to congregate along a wall, or in other places where there is shelter.

In the fields it sometimes happens that a strong wind is blowing when this upward migration takes place. The larvæ, which are comparatively light, are then blown considerable distances from the place where they first appeared above ground, and may be deposited in "windrows" at some protected spot. The writer has not seen one of these "windrows", but has received good evidence of their occurrence in the form of a pint bag, half full of earth-free larvæ, which was brought into the laboratory by a distracted farmer, who saw in them a promise of a total crop failure from cutworms.

Farmers who find these small dull grey maggots, in whatever numbers,

earth which were occupied by the somewhat larger larvæ.

The larvæ are distinctly gregarious, both in the fall, and also in the spring, when they seek locations in which to pupate, and the pupæ are found usually in groups of a dozen or more, though each inhabits a separate cavity in the soil.

These pupæ are very active though they do not appear to move around in the soil.

At the end of ten days, under laboratory conditions, the adults began to hatch, the first appearing on May 10th. During the remainder of the month the flies were very numerous, especially around cottonwood trees.

The larvæ of this genus of flies have not been recorded often as of

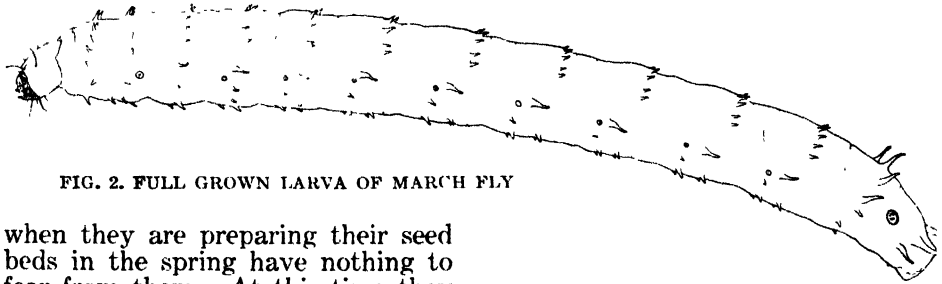


FIG. 2. FULL GROWN LARVA OF MARCH FLY

when they are preparing their seed beds in the spring have nothing to fear from them. At this time they are full grown, and have finished feeding, so that whatever their choice of food may have been, they will have no effect upon the crop which is to be sown. It is advisable, however, when fields are seen to be infested with worms, that a careful examination be made to see whether they are covered with flesh spurs, as in the larva here illustrated. The spurs can be seen with the naked eye, and their presence indicates that this is not a harmful cutworm or wireworm, but a perfectly harmless insect.

The upward migration of the *Bibio* larvæ in spring precedes pupation, for soon after such movement they begin to pupate near the surface of the soil. No cell is made for this transformation, and the pupæ inhabit the cavities in the

economic importance. Occasionally they have been reported as pests of rhubarb, both in England, and on this continent. One species (*B. gracilis*) has also been found damaging fall wheat in Canada, and elsewhere, but up to the present there appears to be no account of their attacking celery, though they have done so to a considerable extent at Lethbridge for two years in succession.

NATURE OF THE DAMAGE TO CELERY

In 1914, when the celery was dug on October 24th, it was found that the soft pulp between the fibrovascular bundles of the stalks had been eaten away to an average depth of 1.5 mm. (1/16 inch). The work of the individual larvæ does

not extend for more than about $\frac{1}{4}$ inch between two of the vascular ridges. A large number of larvæ swarm around infested plants, however, so that the whole of the portion of the plant which is below ground—some nine inches in length—may be affected. Towards the base of the plant, damage is most severe, and the excavations are often confluent, extending for two or three inches in length between the ridges, which are apparently too tough for the mandibles of these insects, and which are left, therefore, standing out very prominently.

Rarely the larvæ burrow deeply into the pulp, thus forming small tunnels. Usually, however, feeding is superficial and apparently not very localized, for small damaged spots occur all over the part of the plant which is below ground, and only at the base, where the plant is most tender do the larvæ appear to feed continuously in one place.

In a typically attacked plant five of the largest stalks were seriously damaged, and three to a lesser extent. The central stems were not damaged.

The attacked areas turn brown during the late summer and autumn, and are the seat of infection for various fungous diseases and small dipterous larvæ, such as *Drosophila* which soon render the plants unfit for the market.

CAUSE OF THE DAMAGE, AND MEANS OF CONTROL

Celery beds are heavily manured, and it is on this manure that the larvæ live, and in the majority of cases mature. When, however, the celery is earthed up during August, many of them are brought into contact with the pulpy flesh of the stalks, and apparently prefer it to their normal food. Thus, if they are plentiful, many of them will collect and feed around the plants and, to a certain extent, between the stalks. An examination of attacked

plants showed that this was a primary attack, and not due to previous damage and consequent decay.

Since this damage is to a large extent incidental to the method of bleaching celery by bringing it into contact with larva-infested earth it is desirable that this method be avoided in places where these larvæ occur in large numbers. Methods of bleaching celery between boards, or prepared paper, which from a horticultural point of view are claimed to be superior to earthing

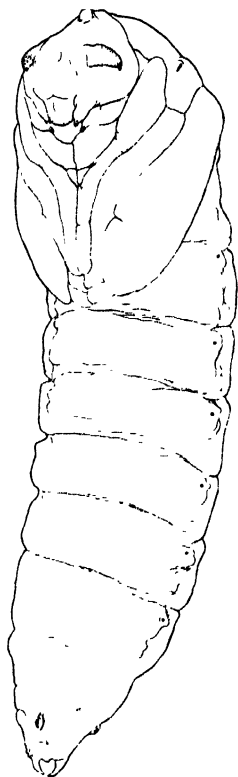


FIG. 3. PUPA OF MARCH FLY, ENLARGED

up have been experimented with at the Lethbridge Experimental Station. Where these were employed the celery did not suffer to an appreciable extent, and the use of these materials is to be recommended as a protection from insect depredations,

as well as from a horticultural standpoint.

DESCRIPTION OF LARVA AND PUPA

The mature larva, of *Bibio abbreviatus* which is here illustrated, averages 12 mm. in length. It is of a dull yellowish-grey colour, with a dark brown chitinous head, which is .86 mm. wide.

On each of the body segments are a number of fleshy elongate tubercles, which vary slightly in number and disposition in different larvæ, though normally they are arranged as is shown in the accompanying illustration, and occur on the various segments in the following numbers:

prothorax, 12; mesothorax, 14; metathorax, 10; abdominal segment I, 16; II to VIII, 18 each; IX, 14; and X, 6.

The pupa is about 7 mm. long, and is a little less than 2 mm. in diameter. In outline the majority of them resemble the object pupa of a moth, though the appendage cases are reduced in length. Occasionally, however, one or both of the wing-cases are free and stand well away from the body. At first the colour is white, with the short antennal cases, only, blackish, but later the whole body surface darkens.

The colouration of both sexes of the adult fly is similar—black, with red legs.

THE FRUIT BRANCH

GREAT BRITAIN'S EMBARGO ON FRUIT

BY F. H. GRINDLEY, B.S.A., ASSISTANT TO FRUIT COMMISSIONER

IN January last the president of the British Board of Trade hinted that an embargo would shortly be placed upon fresh fruits. Soon afterwards a similar ban was reported to have been placed upon canned, preserved, bottled and dried fruits. The reason given for this action was that the vessel space was required for cargoes which were more essential to the needs of the British people.

Ever since that time there has been a great deal of concern among Canadian growers and exporters of fruit as to the possibility of reaching the British market with their products.

Realizing how serious would be the results of such an embargo, not only to the fruit trade of Canada, but to the British importers and retailers of fruit, interested parties put forward every possible argument against the adoption of such a measure.

Fortunately these petitions made

by the Department of Trade and Commerce, the Acting High Commissioner in London, the Canadian Fruit Trade Commissioner at Leeds, and others, resulted (1) in the removal of the embargo on fresh fruits shipped from the Dominions of Great Britain, and (2) the free entry of canned fruits, etc., provided that each shipment was accompanied by a certificate of origin.

At the present time, therefore, there is no restriction upon exports of fruit to Great Britain, so far as their free entry into that country is concerned. The only feature now to be considered—and it is an important one—is whether or not the demands upon vessel space will be sufficiently great to minimize the space available for fruit. Judging from the delays which occurred last year, and the fact that conditions promise to be very similar next season, we are persuaded that shippers will be wise not to depend upon any regularity in the steamship service.

The "Old Country" markets, in a year of average production in Canada, receive approximately 1,000,000 barrels of Canadian apples. It is, therefore, apparent that a serious situation would arise if any pressure of circumstances were to interrupt that trade, and thereby throw upon our Canadian market an additional supply of apples equivalent to over 6,000 carloads. A concerted effort by the fruit growers to extend their home markets, organize distribution and increase consumption in every possible way, would help very materially to relieve the situation. Such efforts would have the additional advantage of effecting results that for some years have been essential to our domestic fruit trade. Canadian fruit growers have been

almost too dependent upon the export market, and have not given sufficient attention to the development and extension of the home trade; the present restrictions on the export trade, should they continue, may, therefore, be in one sense beneficial.

During the past two seasons there has been a most satisfactory demand for the higher grades of fruit, but a very limited market for fruit of inferior quality. We believe, then, that if growers will do their utmost this year to produce a crop of high quality, they will find no difficulty in marketing it at good prices.

We feel hopeful, too, that the facilities for exporting fruit will not be as inadequate as rumours would lead us to believe.

THE SEED BRANCH

PAPER PACKET SEED INVESTIGATION

BY E. D. EDDY, B. S. A., CHIEF OF SEED INSPECTION

AN investigation regarding the paper packet vegetable seeds put on the market by various seedsmen is being conducted. During the past ten years considerable attention has been devoted to the germination of paper packet seeds and part of the information obtained has been published.

In the spring of 1915, about 2,200 samples of packet seeds were collected by the seed inspectors. These have been examined at the Ottawa Seed Laboratory for germinating capacity and the amounts of seed supplied by the different seedsmen. The tests are being continued this year. The results of the first season's work show that there is a great difference both in the quantity and germinating quality of seed supplied by the various firms. Whether the conditions in this respect which were found to obtain in

1915 will continue this year or longer is yet to be determined, and in view of this it might be unfair to mention names in connection with the summary herein presented. In order to bring out the significance of the results so far secured, and to make comparisons, letters are substituted for the different seedsmen's names.

GERMINATION

Nearly 1,800 samples put out in 1915 by the eight leading seedsmen were tested for germination. About 30 per cent of these samples germinated up to and above the standard for good seed, while 20 per cent were below two-thirds of the standard and should have been marked with the percentage germination to comply with the Seed Control Act requirements. The comparative results with seeds from the different firms were as follows:

SEEDSMAN	Number Samples Tested	Per Cent up to and Above Standard	Per Cent Below Standard but above ½	Per Cent Below ¼ Standard
A	155	37	53	10
B	301	41	47	12
C	371	26	58	16
D	169	33	49	18
E	239	34	47	19
F	304	26	46	23
G	78	23	49	28
H	127	15	39	46

AMOUNT AND UNIFORMITY IN QUALITY OF SEED SUPPLIED

There was also a great difference in the amount of seed supplied in the standard five cent packets and in the uniformity of the quantity in the packets put out by the individual dealers. For instance, the average weight of Hollow Crown parsnip seed in the packets put up by A was 3.388 grams, and the average in those put up by B was 6.105 grams. The germination of B's seed was also much higher, so that the weight of germinable seed was nearly four times as great. With Red Wethersfield onions the average weight in B's packets was 6.167 grams, while in H's it was 3.3. In this case the weight of germinable seeds was nearly six times greater in the one lot of packets than in the other. With White Spine cucumber seed the average number of seeds in the packets supplied by the various dealers was as follows: A, 242; B, 350; C, 136; D, 174; E, 132; F, 194; H, 144. The range with Early Winningstadt cabbage was: A, 4.851 grams; B, 4.637; C, 2.816; D, 3.945; E, 3.39; F, 5.671; G, 7.113; H, 4.27.

The range in the amount of seed in different packets put up by the same firm indicates that in many cases there is much room for improvement in uniform filling. In the 10 packets of White Spine cucumber seed examined put up by A the range in number of seeds per packet was from 311 to 174. With one variety of lettuce the range in five packets

was from 5.005 to 3.2 grams. With B's Wakefield cabbage seed the range in six packets was from 7.138 to 3.7 grams. With nine packets of Red Wethersfield onions it was from 8.133 to 4.156 grams. Two packets of Oxheart carrot seed put up by F were examined; one weighed 4.758 and the other 1.762 grams. These cases are more extreme than the average, but there is a wide general variation in the amount of seed in packets put up by the same firm. With some seedsmen this is considerably less marked than with others.

WEIGHT OF GERMINABLE SEEDS

In order to arrive as nearly as possible at the actual value of the seed in the various packets, the weight of germinable seeds was compiled from the actual weight and percentage germination. These results show an even greater range than the germination or weight taken separately. In the following table the comparison of results on this basis with the principal varieties of seeds tested is shown. The letters are substituted for the names of the seedsmen. Where the quantity is given with a decimal point the weight in grams is indicated. Where there is no decimal point the figures indicate the number of seeds. The figures in heavy type indicate the highest quantity of germinable seed for the variety and those in *italics* indicate the lowest. The last three lines of the table are important, as they show for each seedsman the number of

varieties tested and the number of cases in which his seed showed the highest amount of germinable seeds and the number in which it was the lowest:

VARIETIES	A	B	C	D	E	F	G	H
Beans: Golden Wax			28	46	27	28	82	60
Beets: Eclipse	1 859	6 462	3 603	7 097		3 128		1 54
Cabbage: Early Winningstadt	1 269	4 35	2 318	2 3	2 746	2 552	5 712	2 234
Early Jersey Wakefield		4 964			2 998			
Carrot: Oxheart		5 913	2 226	2 391	2 239	1 607	3 358	1 058
Cauliflower: Early Paris				594		897		988
Snowball		742	266	692	325			
Cucumber: Imp. Long Green	192	237	119	141	115	165	129	127
White Spine	184	250	127	169	81	178		71
Lettuce: Hanson		4 927		3 743	2 969	5 759		1 406
Prize Head		4 205	3 471	2 424		5 98		2 94
Grand Rapids	3 505					5 683		4 429
Nonpareil Cabbage	3 52		3 398	3 063	2 712			
Muskmelon: Early Hackensack	108	275	112	143				76
Onion Yellow Globe Danvers	2 04	4 31	3 428	2 836	1 736	3 459	3 289	1 188
Red Wethersfield	3 963	4 675	2 898	3 251	1 108			835
Parsnip Hollow Crown	813	3 028	1 644	1 506	1 882		1 252	1 262
Peas: American Wonder			53	120	41	77	91	63
Radish: French Breakfast		7 352	5 844	7 207			5 424	
Black Spanish	6 10		5 211	5 974	4 798	7 104		5 047
China Rose	5 778	8 934	4 57		5 715			
White Icicle	4 86	8 2	6 902	6 055	5 83	6 172		
Early Scarlet Turnip	5 427	8 598	6 812	6 3	4 004		5 012	96
Squash: Hubbard	25	36	17	24	21	27		
Tomato: Earliana	698		1 135	1 991	878		3 854	1 514
Turnip: Purple Top Strap leaved		11 1	7 909					
Watermelon: Peerless		105	50	35	26			
Total number varieties tested	16	20	23	23	20	15	10	18
Number of varieties showing the largest quantity germinable seeds	1	16	0	1	0	5	3	1
Number of varieties showing the smallest quantity of germinable seeds	4	0	4	2	7	0	1	9

QUALITY OF CROP NOT CONSIDERED

In connection with the above results it should be pointed out that they do not take into consideration the general quality of the crop which would have been produced from these seeds. Such qualities as uniformity, trueness to type,

smoothness and texture of the roots or vegetables can be determined only by field tests. If these qualities could be considered it is possible that the apparent comparative value of the seed of certain varieties put out by various seedsmen, as indicated by quantity supplied and germination, would be considerably altered.

THE DAIRY AND COLD STORAGE BRANCH

SUBSTITUTES FOR RENNET IN CHEESE MAKING

THE Branch of the Dairy and Cold Storage Commissioner has, during the past few months, been carrying on experiments with a view of securing relief in the present shortage of rennet extract for cheese making. In THE AGRICULTURAL GAZETTE for March, 1915, Mr. Ruddick issued a statement pointing out that a serious shortage of rennet extract was likely to be experienced in Canada as a result of the war, for the reason that the stomachs of calves, from which rennet extract is prepared, have, for a number of years, been coming largely from Germany and other European countries. For more than a year the Commissioner has been calling the attention of cheese makers to the situation and recommending that factory men, so far as possible, should provide their own supplies of rennet, as cheese makers did in the early days, by utilizing the stomachs of all young calves locally killed. A pamphlet, designated Circular No. 17 of the Dairy and Cold Storage Branch, was issued and sent to all cheese factories in Canada, explaining the process of saving the stomachs and preparing the rennet. A number of factories followed the instructions and are now independent of the shortage that is likely to seriously curtail the making of cheese during the present year. Indeed, in some instances factories have already closed their doors because of the inability to secure supplies of rennet.

Since early in the present year experiments have been carried on at the Finch butter and cheese factory, owned and operated by the Dairy and Cold Storage Branch, in the use of substitutes for rennet. The experiments were carried through in

two groups, one in which partial substitutes were used in the form of hydrochloric acid, calcium chloride and chloride of lime, and in the other a complete substitute in the form of pepsin. The cheese were made as in the ordinary factory practice. The quantity of milk used in each case was 450 lb. In each test a check cheese was made, using the usual amount of rennet as the coagulating agent. In the case of the acid agent half the usual quantity of rennet was used with a sufficient quantity of the substitute to bring about coagulation in the same time as if the full supply of rennet was used. The quantity of pepsin used was determined on the same basis.

On June 7th a number of experts met at the factory to test the cheese that had been made between May 13th and June 2nd. The cheese will be fully matured and tested from time to time as ripening proceeds. The experts who tested the cheese were Mr. J. A. Ruddick, Dairy and Cold Storage Commissioner; Professor H. H. Dean, of the Ontario Agricultural College; Mr. H. Zufelt, Principal of the Kingston Dairy School; Mr. Frank Hens, Chief Factory Inspector for Western Ontario and Secretary of the Western Ontario Dairymen's Association; Mr. G. G. Publow, Chief Factory Instructor for Eastern Ontario, and Mr. Geo. Hodge, an extensive dealer in Montreal. Without knowing which was which, the experts were given samples of each day's make, so as to compare the full rennet cheese with the one in which the substitute coagulating agent was employed. All of the cheese, with the exception of the one in which chloride of lime was used, were pronounced good and

in some cases superior to those made with rennet. The tests proved that, with the exception of the chloride of lime, all of the agents may be depended upon to make a fairly satisfactory cheese. In consideration of the method of handling and certainty of results obtained, pepsin is the only substitute recommended. The value of this product was proved last season when cheese made with pepsin matured into as fine a quality as those made with rennet.

With a view to affording relief to cheese factories that are short of rennet, the Minister has authorized the Dairy and Cold Storage Commissioner to secure a supply of pepsin that will be offered to cheese makers at cost price, with instructions for its use in factory practice. The following is a copy of Circular No. 19 which has been sent to the cheese factories in Canada:

DIRECTIONS FOR USING SOLUBLE POWDERED PEPSIN AS A SUB- STITUTE FOR RENNET

QUANTITY TO USE

Two drachms of Soluble Powdered Pepsin (1 to 3,000 test) are sufficient to coagulate 1,000 pounds of milk. If a suitable scale is available the required quantity may be weighed, but for convenience, and to save the expense of a scale we have devised a measure, which holds two drachms when level full, to distribute with the pepsin.

TO DISSOLVE THE PEPSIN

Dissolve the pepsin in water in the proportion of three ounces of water for each two drachms, or measure, of pepsin, using preferably a round-bottomed cup or bowl as a container. The water must be at a temperature of 105 degrees F. When the water is added it must be stirred immediately and continuously or it will become a sticky mass very difficult to dissolve. After being thoroughly stirred it is well to

pour the liquid from one vessel to another to see that there is no undissolved pepsin adhering to the vessel.

It is a good plan to add at first only enough of the water to make a creamy paste. Stir until smooth and then add the full amount of water. A few drops of hydrochloric acid added to the water helps to dissolve the pepsin.

TO USE

Dilute the above in the same quantity of water as is used with rennet extract before adding it to the milk.

It is advisable to dissolve the pepsin at least half an hour before using.

The acidity and temperature of the milk should be the same as when rennet extract is used.

If rennet extract is available it is recommended to use half the usual quantity with half the above quantity of pepsin, mixing the pepsin solution with the rennet extract before diluting with water.

NOTES

Scale Pepsin of the same strength (1 to 3,000) may be used according to these directions, and in the same proportion. If either Soluble Powdered Pepsin or Scale Pepsin is of different strength, the quantity used must be varied accordingly. For instance, if the strength is 1 to 6,000, only half the quantity should be used.

It is sometimes found that certain milks require unusual quantities of rennet for proper coagulation and the same thing may be experienced with pepsin. Cheese-makers must use their judgment in such cases and vary the quantity accordingly. Enough pepsin should be used to effect coagulation in the same length of time as it takes with rennet, all the other conditions being equal.

CAUTION

Great care must be observed to keep the stock of pepsin from the slightest dampness. Store in a dry place and keep tightly covered. If it gets damp it will cake and become insoluble and useless.

Along with Circular No. 19 there was sent to each cheese factory in Canada a requisition form for pepsin, which will be distributed only in lots of 1 to 5 pounds at a time.

PART II

Provincial Departments of Agriculture

AGRICULTURE IN CANADA

NEW BRUNSWICK

BY J. B. DAGGETT, SECRETARY FOR AGRICULTURE

NEW Brunswick, which is the largest of the three Maritime Provinces, lies mainly between the 45th and 48th parallels of latitude and the 64th and 68th degrees of longitude. It is almost square in shape and is surrounded on three sides by the ocean; on the north by the Bay Chaleur, on the east by the Gulf of St. Lawrence, and on the south by the Bay of Fundy. This gives it a larger coast line in proportion to its area than most continental countries possess. The area of the province is 27,985 square miles, or in round numbers 17,500,000 acres, about twenty-five per cent of which is occupied, with a population of 351,889, the holdings running from ten to three hundred acres.

HISTORY

New Brunswick was first discovered by Jacques Cartier, a French explorer in the year 1534, but no attempt at settlement was made until the year 1604, when DeMonts and Champlain wintered on an island in the St. Croix River. It was for more than a century after this a French possession, being a portion of the province of Acadia, but, when Acadia passed to Great Britain under the Treaty of Utrecht, it formed a part of the English Province of Nova Scotia. During the French occupation the settlements were inconsiderable, and it had been a long time in possession of the English before much progress was made in settling it, notwithstanding the remarkable fertility of much of its soil.

The first English settlement was established on the St. John River in

the year 1762 at Maugerville, and about the same time a settlement was also founded at the mouth of the river. The people who came to New Brunswick at that time were from the colony of Massachusetts. At the close of the war of the American Revolution, large numbers of loyalists came to New Brunswick, and the city of St. John was founded. New Brunswick was separated from Nova Scotia in the year 1784, and since then has enjoyed a government of its own. After that time large numbers of immigrants came to it from the United Kingdom. Its people therefore are mainly descended from the loyalists and from immigrants from Great Britain, but there is also a considerable French population in the counties along the Gulf of St. Lawrence and in Madawaska. These people are the descendants of the ancient Acadians who were settled here more than two centuries ago.

WATER COMMUNICATION

In the earlier history of the province the rivers of New Brunswick supplied a means of passing from one settlement to another, but since the development of railways, and the construction of good roads, the river system has become less important. Steamboats ply regularly on the St. John River between St. John and Fredericton. There are also steamboats plying in the lower stretches of the St. John to Grand Lake and the Washdemoak, Belleisle and Hampstead, and to Hampton on the Kennebecasis. These boats supply admirable facilities for the farmers in reaching the market at St. John. Steamers also ply on the St. Croix



OATS IN STOOK, SNOWBALL FARM, CHATHAM, N.B.

between Eastport, St. Andrews and St. Stephen and on the Miramichi between Chatham, Nelson and Newcastle, also to points above Nelson and below Chatham. The city of St. John is connected by steamer with Portland and Boston in the United States, with Yarmouth, Digby and other ports in Nova Scotia and with the island of Grand Manan. Steamers also run in the Bay Chaleur between Dalhousie and Gaspé and to Prince Edward Island from Point du Chêne.

CLIMATE

New Brunswick possesses a climate of exceptional healthfulness, and there is no country in the world that is more free from epidemic diseases, or where people live to a greater age than in this province. The most northerly portion of New Brunswick is two degrees south of the most southerly portion of England, and the northern line of New Brunswick is almost a degree south of the latitude of Paris. The city of St. John is in the same latitude as Milan and Venice. The climate, however, differs very considerably from that of Western Europe and especially from that of the British Islands. It is free from humidity, so that the heat and cold are less felt than they are in a damp climate. The change from winter to summer is sudden, and the autumn is protracted and long drawn out, and is the most delightful season of the year. The winter of New Brunswick, when the ground is covered with snow for from three to four months, serves a most useful purpose in the economy of nature, as well as for the business of man. It is during the winter that the lumberman gets his logs together and places them on the banks of the rivers ready for the spring freshet. Without this season the business of lumbering would be far more costly than it is. The snow and frost also have a beneficial effect on the soil. Under the frosts of winter the soil becomes loosened and in a fit condition to receive the seed.

The winters of New Brunswick are healthful and much more favourable to delicate persons than a damp, chilly atmosphere. The summers of New Brunswick are delightfully warm, although not excessively so. Vegetation advances with rapid strides. Not only do wheat, oats, barley, buckwheat, and all kinds of root crops, grow to perfection in the climate of New Brunswick, but also maize or Indian corn, tomatoes and grapes. New Brunswick also produces in abundance apples and all kinds of small fruits.

TOPOGRAPHICAL FEATURES

New Brunswick is what has been described as a rolling country, which means that it is not a dead level like the prairie regions, neither is it mountainous as some portions of this continent are. It is full of hills and valleys, the valleys being very fertile. The highest land of the province is in the northern highlands. West of the St. John river, in York and Carleton counties, it rises into several peaks and ridges to a height of 800 or 900 feet, while the general level is about 500 feet. East of the St. John river the land rises to the watershed dividing the Tobique and other tributaries of the St. John from the rivers which flow eastward. Mountains and broken ranges cross this tract of land in all directions and reach the St. John valley in the vicinity of Mars Hill, which is 1,688 feet in height.

THE SOIL OF NEW BRUNSWICK

Half a century ago the Government of New Brunswick engaged Professor Johnston, a distinguished authority on agriculture and honorary member of the Royal Agricultural Society of England and author of lectures on agricultural chemistry and geology, for the purpose of obtaining from him a report with respect to the agricultural capabilities of the province. This report may be said to be the basis

of all the agricultural information which exists with reference to New Brunswick, although it has been supplemented by additional information which was not available at the time Professor Johnston visited the country. As no man could go over the country within the limited period allowed him for the work, Professor Johnston's estimate of the agricultural value of certain districts has had to be extensively revised. He divided the soils of the province into five classes: First, the soils of the very best quality consisting of river intervalles, islands and dyked marsh lands, of this he estimated the

Brunswick was quite inaccessible and its area was unknown. There is no doubt that the upland of the very first quality in New Brunswick can be safely estimated at 3,000,000 acres, a very large portion of which is still available for settlement. This land Professor Johnston estimated to be capable of producing two tons of hay or forty bushels of oats to the acre. The third class of soil dealt with by Professor Johnston was what he described as second class upland, that is, land capable of producing one and a half tons of hay or thirty bushels of oats to the acre. Of this he estimates that the province con-



NURSERIES IN NEW BRUNSWICK

province to contain 50,000 acres. This estimate, however, is much too low, and should be nearer 100,000 acres. The second class of land which he described consists of the best quality of upland and such portions of good intervalle and marsh land as has not reached the highest point of productiveness. Professor Johnston estimated that the province contained a million acres of this land. This estimate, however, has been shown to be far too low. When Professor Johnston visited the province the splendid agricultural region in the northern portion of New

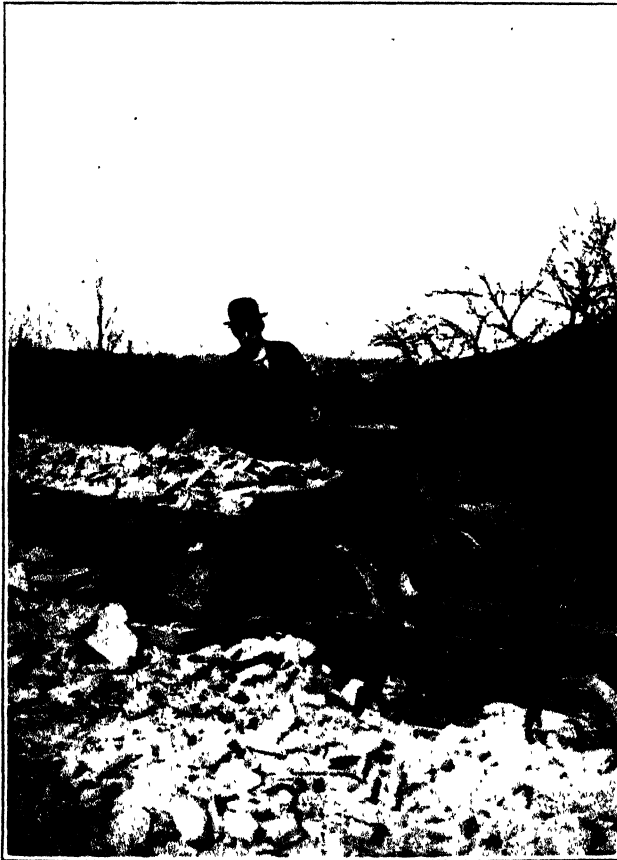
contains 7,000,000 acres. After this came third class upland, inferior in quality to the others, consisting for the most part of light, sandy or gravelly soil, hungry but easily worked, and lands covered with hemlock and other soft woods, which, although difficult to clear, were very favourable for certain crops when cleared.

Some years ago New Brunswick was visited by Professor Sheldon, then of Downton College, and a very practical English farmer, Mr. J. Sparrow. These gentlemen went over a considerable portion of the

province, including some of the new settlements, such as New Denmark, and were highly impressed with the availability from an agricultural point of view. Their reports on this subject are extremely valuable, as the views of persons wholly disinterested, and who were familiar with agriculture and agricultural methods as practised in the British Islands.

the improvement of seed, live-stock, etc. There are also 82 women's institutes, with a membership of 2,500. Ninety-five per cent of these are in the rural districts. The Provincial Government gives generous assistance in the work of the institutes.

Agricultural education is being carefully considered by the Government of the province, special attention being given to elementary agriculture. School gardens are being encouraged and generously assisted. During the summer months short courses are held at Woodstock and Sussex for the training of teachers in elementary agriculture. These courses are very largely attended. Special short courses are held at several points during the winter months; in fact, the entire winter is pretty much given to short course work. These courses are especially planned to meet the needs of those who cannot take advantage of the long courses at the regular agricultural colleges. This is the third year since the courses were instituted and they have been steadily growing in favour.



LIMEROCK CRUSHER IN OPERATION

The farmers of the province are organized into agricultural societies, under the supervision of the Department of Agriculture. There are at present 124 societies, with a total membership of about 9,000. An annual grant of \$16,500 is made by the Government of the province to the societies, which must be used in

The abundance of New Brunswick lands pre-eminently adapted to the successful production of the apple and other fruits, together with the unexcelled social and marketing facilities afforded by their geographical position, have of late years attracted a large amount of interest and favourable comment, and the

Department of Agriculture now feels that nothing short of a special publication, devoted exclusively to the orcharding opportunities in the province, will meet the requests for information being received from all parts of the world.

To men of moderate capital with a preference for fruit growing, or either of its kindred businesses, market gardening and poultry raising, New Brunswick offers special advantages. Such men feel that the price of land in the sections of Canada where fruit growing is of older establishment is altogether prohibitive, and they wish to locate more economically. From the fact that the province has not been exploited as a commercial orcharding country, she is able to offer many excellent farm properties, considerable proportions of which are well adapted to fruit growing, at prices ranging from \$20 to \$40 per

acre, according to the location, the state of cultivation, the percentage of land cleared, and the presence there-on of buildings, etc. Five, ten and fifteen-acre lots of choice fruit land cleared and ready for planting, and especially selected with reference to transportation facilities, etc., will cost from \$50 to \$100 per acre.

The northern part of the province is especially adapted to the growing of potatoes, a quality of potatoes being produced in that section which has found very special favour in both the American and Canadian markets.

During the year 1915 crops produced in the province were as follows:

Buckwheat	1,085,449 bushels
Oats	5,841,850 "
Potatoes	8,384,591 "
Turnips	3,733,763 "
Wheat	268,899 "

BRITISH COLUMBIA AGRICULTURAL COLLEGE APPOINTMENTS

Progress is being made in organizing the staff of the College of Agriculture of the University of British Columbia. Two appointments have recently been made, Mr. Paul A. Boving, Field Root Specialist at Macdonald College and Mr. F. M. Clement, B.S.A., Director of the Ontario Horticultural Experiment Station at Vineland. Mr. Boving is appointed Assistant Professor in Agronomy and Mr. Clement, Professor of Horticulture. These officials will take up their new duties in September, under Professor L. S. Klinck, Dean of the Faculty of Agriculture.

Mr. Boving was born in Sweden in 1871. He was educated at Malmo and at Alnart University. He carried on practical work in field husbandry and dairying in Sweden, Denmark and Germany. From the time of his graduation at Alnart University until 1900 he was teacher at an agricultural high school in Sweden and was for six years attached to an extensive seed firm at Gothenberg. During this period he was chairman of the Plant Breeding Committee of the province in which he lived. Mr. Boving came to Canada in 1910. After a few weeks of employment at the Central Experimental Farm he received his present appointment at Macdonald College to take charge of root crop investigations.

Mr. F. M. Clement was born in the Niagara Peninsula, where he grew up and received his early education. He graduated from the Ontario Agricultural College in 1910. During the previous summer he carried out an extensive orchard survey in the southern part of the province. During the two years following his graduation he was District Representative for the Ontario Government, in Elgin county. In 1912 he received an appointment on the staff of Macdonald College as assistant to Mr. T. G. Bunting, B.S.A., Professor of Horticulture. Two years later he resigned this position to accept the Directorship of the Horticultural Experiment Station at Vineland, Ontario, which position he will relinquish to take up his new duties in British Columbia.

THE VENTILATION OF LIVE STOCK BUILDINGS

The necessity for the proper ventilation of live stock buildings is recognized. The principles of ventilation are, in a general way, fairly well understood, but the application of these to actual practice is not so uniformly agreed upon. In view of the importance of the subject there has been here brought together descriptions, explanations and illustrations of the systems of ventilation used in the Government live stock barns in the various provinces.

NOVA SCOTIA

THE KING SYSTEM OF VENTILATION

BY JOHN M. TRUEMAN, B.S.A., PROFESSOR OF AGRICULTURE, AGRICULTURAL COLLEGE, TRURO

BEFORE coming to the Nova Scotia Agricultural College the writer spent twenty years in the United States. While there he became very familiar with the King system of ventilation as advocated by Professor F. H. King of the University of Wisconsin. This system is the only one that I found in use in the various university barns with which I became acquainted, and was also seen, and its results noted, in a great many private barns. My experience with the system, both in the United States and in Nova Scotia, has given me perfect confidence in its efficiency, and I know that it will work well when properly installed. In this article I plan to emphasize the good points of the King system as strongly as possible. This I do because I am familiar with it, but no one will note with more interest the arguments and experiments showing the advantages of other systems.

The King system differs from the Rutherford in removing the stale air from a point near the floor instead of at the ceiling, and admitting the fresh air near the ceiling instead of at the floor. In the Rutherford system the air warmed by the animals passes directly to the ceiling where it at once escapes; the cold air comes in at the floor and makes the floor and lower part of the building very cold in severe weather. This system gives the purest fresh air for the animals to breathe, but in the average farm barn, as far as my experience goes, it keeps

the place so cold that the animals are uncomfortable, and the farmer, therefore, closes up the outlets and all ventilation ceases. In a large barn with a small amount of surface exposed to the weather in proportion to the stock housed, the inlets and outlets in the Rutherford system can be so arranged as to give satisfactory results, as has been shown by experiments at the Central Experimental Farm, Ottawa.

The King system when used in the average-sized barn will furnish an abundance of fresh air, but will not allow the barn to become too cold at the same time. The air warmed by the animals rises toward the ceiling. Here it is mixed with the fresh cold air coming in which it partially warms. This allows the temperature of the stable to rise to a point that makes it comfortable for the animals without the air becoming vitiated. If the objection be made that this causes the animal to breathe over and over the same air it may be pointed out that the heavier carbonic acid laden air tends to settle to the bottom of the warm room. The warm air at the ceiling is the purest air in the room; this mixed with the fresh air from outside gives excellent results in good air for breathing, as has been demonstrated in hundreds of barns

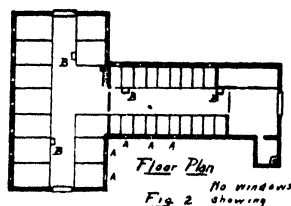
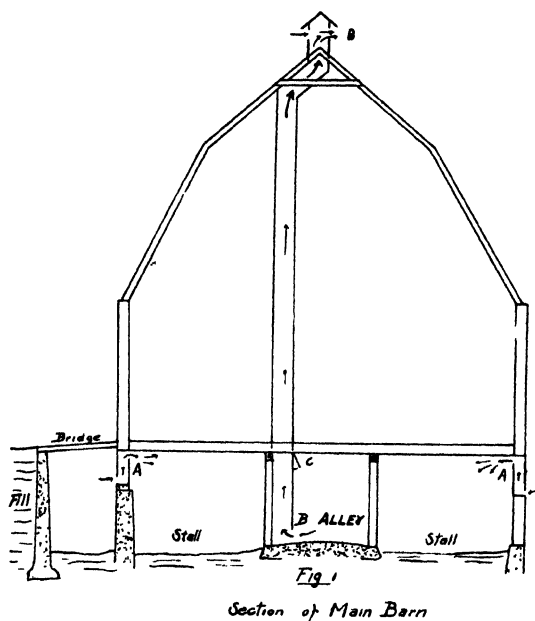
At the same time the heavy carbonic acid is being drawn off from the bottom of the stable by the large outlet shaft that has its opening within a foot of the floor. Although this

heavy air settles in the warm room it is still lighter than the outside air and so readily ascends a large shaft that carries volume of air enough to keep the shaft warm as it ascends.

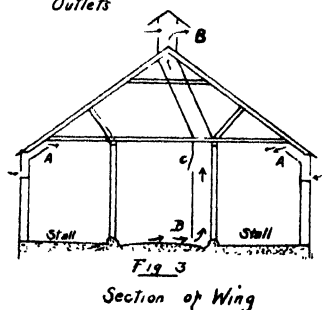
Here is the important point in installing the King system. The outlet shaft must be large and the draught unobstructed. When this is properly arranged the system works to perfection.

Figures 1, 2 and 3 show how this

inlet shaft is simply a wooden box in the wall, the inside should be double boarded with an air space left between the two layers of boards. This is to prevent frost from accumulating on the wall where the incoming air makes it very cold. Regulating slides should cover the inlet opening on the inside as shown at A in Fig. 6. If there is a heavy wind the openings on the windward side of the building can be partially or wholly



A - Fresh Air Inlets
B - Foul Air Outlets
C - Door - open in warm weather



THE KING SYSTEM OF VENTILATION
Horse barn, Nova Scotia Agricultural College

system has been installed in the college horse barn. The inlets for fresh air are at A. The outside opening must be lower than the inside; the air enters an opening on the outside of the building and rises through a shaft in the wall to a point near the ceiling of the room to be ventilated. This prevents the warm air from escaping at the ceiling, as it would do if the opening went straight through the wall. Figures 4 and 5 show different methods of arranging this inlet shaft in the wall. If the

closed to prevent the stable from becoming too cold. The inlet openings on the outside are covered with heavy wire netting. In most stables the inlets should be put about 10 feet apart, giving about five inlets on each side of a 50 foot barn.

The outlets may be placed in any convenient place in the stable. The important requirement is that the shaft be large and the draught unobstructed. If the cross section of the outlet is large enough, and the full size is carried clear through the

roof, and the end left fully open, the draft will be all right. The cross section of the outlet shaft should be about double the square feet in the combined cross sections of all the inlets. If there are 10 inlets 6 x 12 inches their combined cross section will be 5 square feet, and the outlet shaft should then be about 3 feet square giving 9 square feet in the cross section. This is the place where the King system is often wrongly

be arranged. Figures 1 to 7 show different arrangements of the outlets with the openings for entrance of foul air at B. As shown in Fig. 1 of the college horse barn the shaft goes up straight from the ground floor to the roof, just far enough from the centre not to interfere with the passage way below, or with the hay-fork in the roof. In Fig. 3 the outlet is shown at one side far enough to leave the passage way clear below.

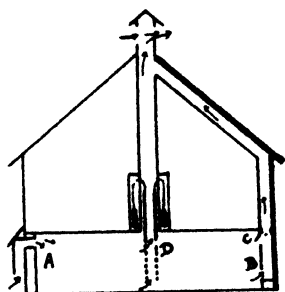


Fig. 4

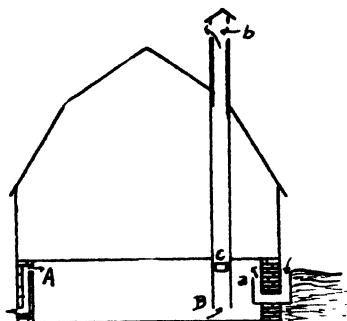


Fig. 5

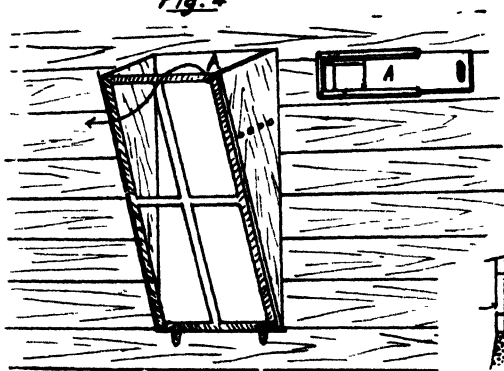


Fig. 6

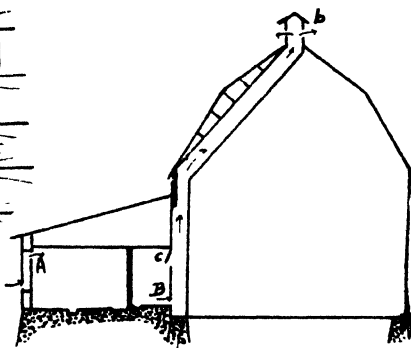


Fig. 7

THE KING SYSTEM OF VENTILATION

Fig. 4. showing how the outlet shaft may extend up through the centre of the barn, or up one side and along the roof.

Fig. 5. shows the inlets through brick, stone or cement walls, also how inlet may be arranged in bank-barn. The outlet is carried up a few feet from the centre of the barn in order to be out of the way of the hay-fork.

Fig. 6. showing how windows may be hinged at the bottom and swing in at the top to give more fresh air in mild weather. Also shows slide to regulate amount of air entering through inlet shaft.

Fig. 7. showing how inlet and outlet shafts may be arranged on a lean-to stable.

installed. The outlet is made too small and the air cools in the shaft and does not draw well. Two or three small shafts will not do the work as well as one large one. For a barn 30 x 50, one outlet shaft is enough, for a barn 36 x 72, two outlets should

Where the passage way in an old barn is too narrow to allow of putting in a solid shaft the arrangement shown in Fig. 4 may be used. A moveable sleeve on weights is hung in the shaft and can be pulled down at night, and when work is not being done in the

day time. In summer time it is left up and is thus entirely out of the way.

A door should be put in the side of the outlet shaft at the ceiling, as shown in the figures at C. In warm weather this door is opened and the hot air taken out directly from the ceiling. As an additional source of fresh air in warm weather the windows may be arranged as shown in Fig. 6.

The cupola should be connected directly with the outlet air shaft as shown in all the figures, and the opening in the cupola should be en-

tirely unobstructed with boards. No louver boards should be put in but something like two feet of clear space left all the way round the cupola.

Where the shaft is against the outside of the barn as shown in Fig. 4 the wall next the outside should be double boarded; that is to say, do not use the wall of the barn for one side of the shaft, but build a complete shaft independent of the barn. This will give a tight shaft less affected by the cold and consequently a better draught. Where much of the shaft is outdoors as in Fig. 5, it should be double boarded above the roof.

QUEBEC

THE Reverend Noël Pelletier, Director of the School of Agriculture, Ste. Anne de la Pocatière, writes to THE AGRICULTURAL GAZETTE as follows:—

The Rutherford system of ventilation is the best, in our opinion. It is in use in the dairy barn, where it gives entire satisfaction. The horse

barn is ventilated by the Vassot system, but this is actually being replaced by the Rutherford. A combination of both systems is used in the piggery, but the results have not been satisfactory. Eventually, I think, only the Rutherford system will be used in our buildings.

THE ONTARIO AGRICULTURAL COLLEGE

BY G. E. DAY, PROFESSOR OF ANIMAL HUSBANDRY

THE system of ventilation in use in the college stables is a modification of what is commonly called "the Rutherford system." It is simple, inexpensive, and probably as effective as any other known method.

The main dairy stable at the college is 40 x 110 feet, exclusive of feed room. On each side of the stable there are seven fresh air inlets, (fourteen in all), distributed at regular intervals. The inlets are merely holes through the wall, opening on the inside near the floor. In the college barn, the connection between the inside and outside opening rises inside the wall, so that the outer opening is higher than the inner one. The same object could be attained by boxing in the outer opening, leaving the top of the box open, the idea being to prevent the

wind from blowing directly through the openings.

In the college barn, the openings are equipped on the inside with a register, like the floor registers used for hot air furnaces, so that the inflow of air can be controlled. A cheaper device would be a simple slide on the inside of the wall, which could be moved to regulate the size of the aperture. Some means of controlling the inflow of cold air is absolutely necessary if the temperature of the stable is to be kept at all uniform.

The inlets are twelve inches square, but the registers materially reduce this capacity. If equipped merely with slides, possibly half the number of inlets would be sufficient.

The outlets are six in number, and are about 20 inches square. They open at the ceiling and run straight

up through the roof, the shafts being of inch matched lumber. Each one is equipped with a slide at the ceiling, so that in extreme weather some of them can be closed, if thought necessary.

There is a loft above the stable for the storage of hay, and, to avoid interfering with the hay fork, the ventilating shafts are placed at least six feet to one side of a line

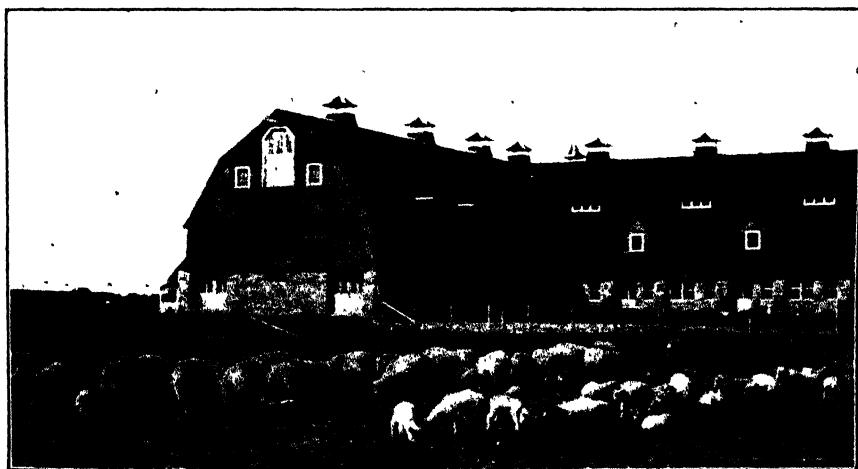
along the centre of the building, and are placed at regular intervals, alternately, first on one side and then on the other of this centre line. They are carried straight through the roof, and to such a height as to make the outlet higher than the ridge of the roof. The outlet is equipped with a stationary metal cowl, which tends to prevent a down draught.

SASKATCHEWAN

BY W. J. RUTHERFORD, DEAN, COLLEGE OF AGRICULTURE, SASKATOON

THE University of Saskatchewan has installed in its barns what is known as the Rutherford system of ventilation. At the time the barns were built in 1911 this was believed to be the most suitable for prairie conditions subject to extremes of temperature and high winds. Dr. J. G. Rutherford, who was at that time Veterinary

and reported most favourably upon the results obtained from the Rutherford system. We found on inspecting the barns at the Central Experimental Farm, Ottawa, that the main cattle barn and the horse barn were well ventilated. Other barns in other places with other systems were not as well ventilated. On the strength of the advice of Dr. Ruther-



THE MAIN BARN AND FLOCK, COLLEGE OF AGRICULTURE, SASKATOON, SASK.

Director General for Canada, originated the system twenty odd years ago in his barn at Portage La Prairie, Manitoba. Mr. J. H. Grisdale, Director of Experimental Farms, experimented with it, and other systems,

ford, the experimental evidence of Mr. Grisdale, and our own observations, we equipped our barns with the Rutherford system. It works satisfactorily. The results will not be satisfactory unless the proper

precautions are observed as to its installation and operation. The following description taken from *Farm Building Series*, Bulletin No. 1, entitled *Combination or General Purpose Barns*, issued by the University of Saskatchewan and the British Columbia Forest Service Branch is explanatory:

"Fresh air ranks with sunlight as one of the prime necessities in any building used for the housing of live stock. Too much stress cannot be laid upon this point. Foul air is certain to cause disease. A stable lacking proper ventilation is neither sanitary nor comfortable. Low temperature does not mean pure air, and the purity of the air in a stable cannot be judged by its temperature.

"The necessary conditions in a good ventilation system are: (1) No animal should be in a direct draught. (2) Each animal should get a sufficient amount of fresh air; no animal should be in a corner or a space where the fresh air does not circulate and from which the foul air is not carried off. (3) The currents of air should all be in the one direction—that is, away from the cold walls and towards the outlets. (4) The ventilators should be easily controlled so that in extremely cold weather the temperature need not be unduly lowered.

"The Rutherford system of ventilation is used in all the barns shown in this bulletin. It is one of the best in use and is recommended by most authorities in Canada. In this system the fresh air is brought in through a number of small openings or ducts at the bottom of the outside walls, so distributed that fresh air is diffused throughout all parts of the stable. These ducts are generally raised up inside to about eight inches above the floor, so that cold draughts will not run along the floor. As it is used and becomes warmed the air moves gradually to the centre of the building and up to the ceiling and out through the outlets. There should be no cross current nor tendency to bring air once breathed and warmed in contact with the outside wall. Usually about one outlet is provided for every four inlets.

"Where the mangers are against the wall it is sometimes difficult to introduce the air without causing a draught on the animals. In an experiment carried on at the Central Experimental Farm, Ottawa, to avoid this difficulty the fresh air was carried underneath the floor of the stall. Where this is done care must be taken to have the air shaft absolutely water tight. This can be ensured by using vitreous tile pipe with cemented joints. If the air is brought in at the manger it should be

broken up into very small openings (auger holes) so as not to create a draught. If there is a feed passage along the wall it makes an excellent place for bringing in the fresh air.

"The air should be brought in through small openings and at frequent intervals. An opening should not be larger than six by eight inches. Six or four inch tile pipes make good ducts. Eight square inches of inlet should be allowed for each cow two years old and over, and ten to twelve square inches for each horse. The inlets should be placed along the walls so that they will distribute the fresh air as far as possible throughout the entire stable. The inlets on the outside of the walls should be carried up high enough to be above the snow line and also to prevent dust and rubbish from blowing into them. The openings should be on the side walls of the inlet and not the face so that strong winds will not blow directly into them and affect the ventilation within the barn. Fly screens should be put over the openings.

"The currents of air should be all in one direction—that is, towards the outlets. The air breathed out by animals is heavily laden with moisture. If this moisture-laden air is kept too long in contact with a cold wall or ceiling surface, the moisture will be deposited in the form of hoar frost, and the next mild day the wall will begin to drip. There is nothing so uncomfortable as a wet barn. When an animal gets its coat wet it has to supply sufficient animal heat to evaporate the moisture. That this waste of heat—or in other words, food—is considerable is shown by the fact that it takes five and one-third times as much heat to evaporate water as it does to bring it from the freezing to the boiling point. In this connection the construction of the walls is very important. Unless they have some form of insulation such as a dead air space, it is impossible to keep them dry, except by lowering the inside temperature to approximately the same as the outside. Double walls with a dead air space between will keep dry if there is a good circulation of air in the stable. No system of ventilation will keep solid stone or cement walls dry—especially in very cold weather—unless they are wood lined. (See Bulletin 78, Department of Agriculture, Ottawa.)

"The outlets should be not less than 16 inches in diameter, and 24 inches is preferable. About 20 square inches of outlet space should be allowed for each animal. The outlets should be located as near the centre of the barn as possible. They should be built of two-ply lumber with tar paper between, to make them as air tight and as warm as possible. The air that is carried up the outlets is full of moisture, and if the outlet is cold it will soon collect a lot of hoar frost. The outlet should be built with as few angles as possible and be

carried above the ridge in the form of a cupola. In the cupola it is preferable to have the sides open rather than covered with slats. If the roof is carried well over the walls there is not much danger of the snow and rain beating in the open sides.

"The ventilation system should be easily controlled. The higher the ventilator is carried the greater the amount of air it will take out of the barn. Also the greater the difference in the temperatures between the inside of the stable and the outside, the more air will be carried off. Consequently it is necessary to control the outlets with a

damper, the controlling cords of which should be brought down into the stable for convenience. The exact amount of opening for different weather conditions is soon learned and it is only a minutes job to adjust two or three ventilators before leaving for the night.

"No ventilating system is automatic for all conditions of wind and temperature, but the Rutherford system can be operated with a minimum of attention and has proved to be most successful for conditions in the West."

The purpose of the school gardens is not primarily to obtain large production. Through the work that children do in the garden education is sought to be given. Therefore, connected with every plot cultivated, a child should have a problem which he is endeavouring to solve by actual demonstration. Interested industry guided by intelligence and careful observation and reasoning directed toward a conclusion affords a training for good citizenship. If while children are at school their thoughts and efforts can be directed to obtaining a knowledge of local conditions the country must surely be the gainer. Our own boys and girls will make better citizens than any immigrants, however desirable--and we have room for tens of thousands—who may come to our shores.—*New Brunswick, Rural Education Monthly.*

NOVA SCOTIA

EXTENSION WORK

BY M. CUMMING, B.A., B.S.A., SECRETARY FOR AGRICULTURE

THE extension work of the Department of Agriculture in the province of Nova Scotia will not be developed as much during the current year as was originally planned, mainly for the reason that a number of members of the staff have enlisted in the overseas service of the Empire, and it has been decided, temporarily at least, not to replace these men.

DAIRYING

However, no effort will be spared to develop the dairy policy of the province, a policy which in the past five years has led to an increase in the output of the creameries of the province of over 400 per cent. The dairy work is financed in part by appropriations from the Provincial Government, and in part by the appropriation from the Federal grant under THE AGRICULTURAL INSTRUCTION ACT. The principal work which is being done is that of organizing the province, so that the twenty-two creameries and seven cheese factories in existence, may be enabled to handle the great bulk of the milk and cream, which is to be manufactured. This means cream shipping sometimes nearly one hundred miles, and the arranging of routes in those parts of the country where railway service is not available so that cream can be brought in from distances of thirty or more miles. Thus far this work has been extremely successful, and the result is that most of the creameries of the province promise to become large producing plants, which will consequently be able to manufacture more cheaply than would smaller

plants where the over-head charges would be almost as big as in the larger plants. Along with this organized campaign educative meetings are being held, and every effort put forth to get the farmers to take up cow-testing in this and other lines of work. The provincial officials work in co-operation with the officials of the Dairy Division of the Dominion Department of Agriculture.

COUNTY REPRESENTATIVE WORK

The county representative work is being gradually extended, although in order to make the expenditure for this purpose as effective as possible the Department is sending out several of the men for only six or seven or eight months of the year, i.e., during the growing season. A special effort has been made in this way to reach the more outlying counties. These county men, in addition to a general educative campaign, are personally superintending demonstration plots on farms, are introducing improved varieties of grains, potatoes, etc., are encouraging cow-testing, are assisting in the marketing of wool, and, in fact, are generally lending themselves to any improvement which will lead to the betterment of the farming communities in which they are working. In selecting these men special emphasis is placed on securing men who can, if necessary, put in crops of all kinds in a manner that will be a demonstration in itself to the farmers of the country.

ORCHARD DEMONSTRATIONS

On some twenty-two different fruit farms demonstrations are being car-

ried on in various methods of spraying, with special reference to the treatment of bud moth, aphids, canker and black spot. In this work too the provincial officials are working jointly with the officials of the Entomological Branch of the Dominion Department of Agriculture. This uniting of forces is preventing a great deal of overlapping and is making the work much more effective than it otherwise could be.

For the first year in the history of the province, a thorough inspection of apiary plants will be made with a view to the suppression of contagious diseases among bees.

HOME ECONOMICS

In the purely educative line, plans have been made for short courses in home economics for women. One of these was held recently at Lawrencetown in the new demonstration building, and was attended by over a hundred students at each session.

The greater part of this extension work is being financed out of the federal grant under THE AGRICULTURAL INSTRUCTION ACT. Through this agency, the Department of Agriculture and the College are getting closer to the people, and are doing more effective work than ever before.

QUEBEC

THE INDUSTRIAL FARM SYSTEM

BY H. NAGANT, EDITOR OF THE JOURNAL D'AGRICULTURE

A number of institutions of the province of Quebec (asylums for the insane, orphanages, jails, reformatories and industrial schools) own industrial farms, or, at least, large areas which are cultivated in order to reduce the cost of maintenance and to provide the various classes of inmates with an opportunity to get a training in agriculture and to do useful and healthy work.

I will review briefly the chief industrial farms of Quebec.

Quebec jail.—Before the Battlefields Park was established, the Quebec jail, which is included in the park, had a rather large farm that yielded a good revenue and gave plenty of work to the inmates. There are now only six arpents of arable land yielding the necessary vegetables for the jail staff. The garden work is done by the prisoners under the supervision of a special guard. The director of the jail, Mr. J. B. Carbonneau, proposes to give special attention to the cultivation

of this ground this year in order to keep his prisoners busy and to give them a liking for this kind of work.

Montreal jail (Bordeaux).—The Government property on which the Bordeaux jail is built covers 150 arpents, 60 to 75 of which are actually under crop. As this farm has not been cropped for a number of years it was necessary to remove the stones and level the ground before sowing seed grain or vegetables. The director of the jail, Mr. J. T. Landriault, informs us that up to the present the work done is rather clearing work, with a view to keep the prisoners busy, but it is proposed in the near future to turn this property into a model farm yielding a sufficient quantity of crops of all kind for the needs of the jail.

REFORMATORIES AND INDUSTRIAL SCHOOLS

Montreal reformatory.—No agriculture is carried on here, only gardening on a large scale. The children are keenly interested in this work.

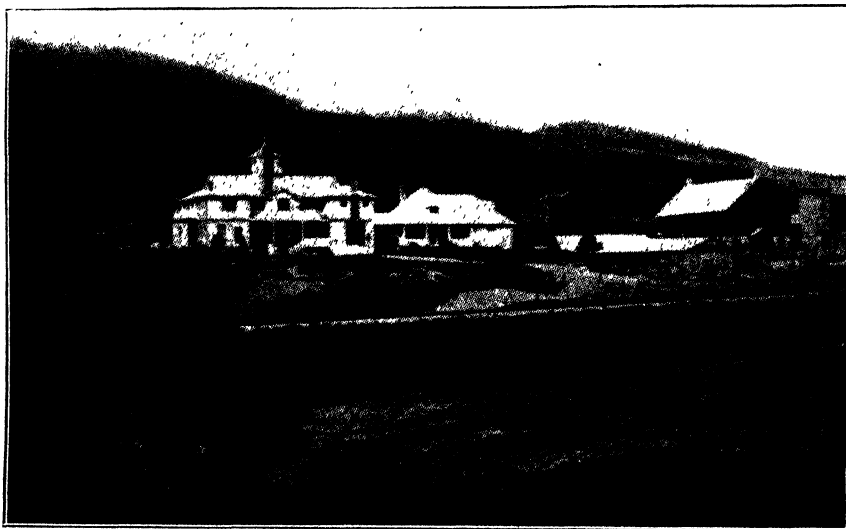
Bon Pasteur reformatory for girls at Laval-des-Rapides, near Montreal.—The convent and the various buildings are in the centre of vast grounds. This land will be cropped in the near future for the benefit of the institution and of the children.

Levis Industrial School (near Quebec).—No farm here but large gardens where the teachers and the pupils do agricultural work.

Boys' Farm and Training School at Shawbridge, Terrebonne County.—This institution, which has just published its ninth annual report,

cows, of which there are twenty-five and practising cow-testing. Several have helped in building waterworks, in clearing and removing the stones of several arpents of land, always under the supervision of a foreman.

Each year, some of these pupils secure work on good farms or as office clerks, carpenters, cooks, tailors, etc. Most of the food consumed by the pupils is produced on the farm. The value of the produce obtained on this farm amounts to about \$4,000 every year.



BOYS' FARM AND TRAINING SCHOOL, SHAWBRIDGE, QUEBEC

owns 100 acres of land, 35 of which are occupied by the school and the farm buildings. The pupils, who average about 100 in number, are classed according to their knowledge and accomplishments, and they receive the teaching which suits them best.

Some work in the vegetable garden, others in the orchard, the poultry yard, among the bees, in repairing harness, carriages, buildings, in doing work in the laundry and in the kitchen, in the sewing room, making canned fruits, preserves, milking

AGRICULTURAL ORPHANAGES

St. Damien de Buckland, Bellechasse county.—This establishment is one of the most progressive institutions in the province, agriculturally speaking. It subsists mainly on the produce of the farm, feeds and keeps over two hundred persons, most of whom are old and destitute; furthermore, a large number of children follow an elementary and model course and receive an excellent intellectual and religious training.

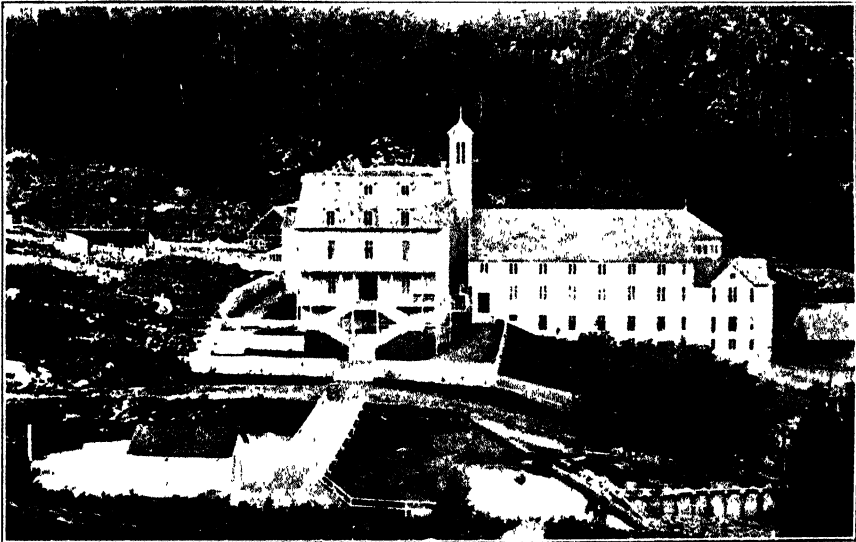
The convent, under the direction of the Reverend Sisters of Notre-

Dame du Perpetual Secours, is built on a sunny height. The following notes have been supplied by the bursar of the institution:

"The farm includes an area of 466 arpents, 108 of which are under cultivation, 143 in pastures, 35 in hay meadows and 170 in timber. Our crops of 1915 were as follows: 870 bushels of oats, 8,900 bundles of hay, 15,000 bushels of potatoes, 250 bushels of vegetables, 10 bushels of onions and 25 tons of ensilage.

"The rotation is as follows: 1st year, oats on breakage; 2nd and 3rd years, potatoes; 4th year, ensilage; 5th year, oats; 6th and following years, hay, as long as it gives good yields.

workmen, farmers or manufacturers. The best educated among them work during working hours and teach during school hours. Their mission consists in bringing up children whose parents are dead, or have disappeared or are incapable. They give them a religious education, suitable elementary instruction, professional instruction, especially agricultural, so as to induce them to work on the farm. This is the reason why the establishments of these Brothers must be farms where practical agriculture is taught.



INDUSTRIAL SCHOOL, N. D. DE MONTFORT

"The orchard, inaugurated in 1899 on a spot covered with large stones and numberless stumps, measures an arpent and a half square. Every year new plantations are made. It now yields various kinds of very good apples; for the last two years the crop was over 300 bushels. We also have cherries, gooseberries, black currants, raspberries and strawberries.

"A silo built in 1913 holds 25 tons of ensilage: corn, oats and tares. This silo is very useful. Thanks to the ensilage, our cows give as much profit in winter as in summer."

Vauvert, Lake St. John.—The founders and directors of the establishment are brothers; they are

The Vauvert Agricultural Orphanage, situated near Peribonca, north of Lake St. John, was established on the 1st of July, 1907. The Brothers cleared land like all settlers; they secured twenty lots from the Quebec Government, got their letters patent in November, 1912, after five years of settlement and intended to have an industrial and model farm sufficient for the needs of two hundred people. At the beginning, only thirty were living on the farm, twenty-five Brothers and a few orphans. Everything had to be organized,—a

start had to be made in the bush and provisional camps had to be built. Last fall the establishment included seventy people, the population increasing in proportion with the means of the Brothers.

There are three hundred acres of cleared land. The live stock includes 5 horses, one colt, about 30 cattle of which 13 or 14 are cows, 2 to 4 dozens of pigs, 40 sheep, Plymouth Rock hens and 11 bee hives. Near

oschestra for the use of the children and three classes. Unfortunately, this charitable institution has received a severe check in its development, owing to the departure of ten of the Brothers who were reservists in the French army.

Montfort-Huberdeau (Argenteuil).

—A first class institution, where destitute children are kept under the direction of the best of qualified teachers. Agriculture and horticul-



INTERIOR OF GREENHOUSE, PROTESTANT HOSPITAL FOR INSANE, AT VERDUN, NEAR MONTREAL

the buildings is a well-fenced garden and experimental field and a nursery for fruit trees and shrubs. All the industries that are useful to farmers may be found in the establishment—bakeries, laundry room, shoe-making, harness-making, sewing, blacksmith, carpentry, saw mill, etc.

There is a small pharmacy with an infirmary, a post office, a chapel which is attended by a priest of the diocese of Chicoutimi, a band or an

ture are practised on the farm of Huberdeau.

ASYLUMS FOR THE INSANE

St-Michel Archange, Beauport, near Quebec.—This asylum possesses a fine farm on which garden work is carried on. A large number of inmates work regularly on this farm and this work, well regulated, is very beneficial to them, physically and morally.

Hospital St-Jean de Dieu, Montreal.
—Soeur Amarine, Superior, supplies this description:

"The farm annexed to the asylum for the insane extends from the St. Lawrence river to St-Léonard and is surrounded by the city of Montreal. It includes an area of 418 square arpents, from 20 to 300 of which are under cultivation, including an orchard, a vegetable garden, a greenhouse and various flower beds grown in order to cheer our unfortunate patients.

"The main object of the cultivation of this farm—leaving out the revenue, which is not a negligible quantity—is to provide our patients with one of the best treatments: a moderate and pleasant work. From 100 to 150 inmates are employed, according to their desire and their aptitude.

"Usually we keep from 40 to 50 cows, 25 horses, 200 to 250 pigs, 350 to 400 chickens, 150 to 200 rabbits and about 50 pigeons."

Verdun Asylum for the Insane.—The Verdun Protestant Hospital for the insane and the farm which is annexed to it are situated within the limits of the town of Verdun, on the north shore of the St. Lawrence, a mile below Lachine Rapids. There are 750 inmates. The farm in-

cludes an area of 225 acres, 45 of which are under pasture, 45 in lawns and ornamental grounds, 10 in timber, and 125 are cropped. There are now 15 acres in oats, 53 in roots, 6 in vegetables, 6 in fruits, 30 in hay and 15 in ensilage corn.

There are 14 horses, 30 cows and 50 pigs. The cows produce sufficient milk for the needs of the institution. Young pigs weighing about 100 lb. apiece are bought; they are fed with the by-products of the establishment and sold when they weigh 200 lb.

An intensive system of cultivation is followed; the land is heavily manured and kept at a high degree of fertility by frequent cultivation. The object is to obtain every year a maximum yield.

In his report, Dr. J. W. Burgers, superintendent of the asylum, says:

"Although the farm does not yield sufficient products for our needs, it enables us to give healthy work in the open, in the poultry houses and in the greenhouses to a large number of our patients."

DAIRY STATISTICS FOR 1915

BY G. E. MARQUIS, CHIEF, BUREAU OF STATISTICS

ORGANIZATION OF A BUREAU OF STATISTICS

WITH the establishment of a Bureau of Statistics the province of Quebec is now able to publish statistics compiled from absolutely reliable sources and presented in a rational manner; such statistics bear on various points of political and administrative organization, as well as on the movement of the population, production, exchange of produce, etc.

The Year Book (*Annuaire Statistique*, 1915), published by this new branch of the Quebec Government, contains statistics on the production of butter and cheese in this province in 1915.

SYSTEM OF INSPECTION

The new law concerning the inspection of factories was passed at the beginning of the last session. The province is divided, for the purposes of this law, into 50 regular divisions, thus distributing the work among 50 district inspectors. These inspectors are under the control of the Department of Agriculture.

In order to defray the cost of this general inspection, each factory is required to pay a fee of \$15 per year.

The inspectors were asked in the spring of 1915 to collect figures concerning the making of butter and cheese during the season that was then commencing, and to forward the same in February to the Bureau of Statistics.

COLLECTION OF STATISTICS ON DAIRYING

Before the opening of the season report forms with complete instructions are forwarded to each inspector, who is requested to distribute the same to the cheese and butter makers at his first inspection.

The inspector must also, at each visit, ask to see the report form in order to make sure that the figures are entered correctly and to correct mistakes, if any. At the end of the factory season, the report is to be forwarded at once to the inspector by the manufacturer, who certifies the same as being conformable to the books of the factory.

These private reports are entered in a special book by the inspector for all the factories of the district, the averages are computed, and a summary of the work of each inspection division is noted on the cover of the bulletin.

On the first of February these bulletins are handed to the Bureau of Statistics, which compiles the same and publishes the figures by counties in the Year Book.

This compilation is not complete as yet, but it is possible to supply temporary figures for 1915. Final statistics will not show much variation from these figures.

CHEESE AND BUTTER PRODUCTION IN 1915

Before giving the statistics of production, some explanations are necessary. For instance, there was an increase of 113 factories in 1915, compared with the preceding year. The number of cows supplying milk to these factories has also increased by 35,271.

However, in spite of this fact, there was no increase of production in 1915; on the contrary the quantity of butter manufactured shows a decrease of one million pounds, and

cheese a decrease of three and a half million pounds.

The cause of this decrease is well known. It is due to the summer drought that has prevented the growth of pasture grass.

Mr. H. Nagant, Editor of the *Journal d'Agriculture*, wrote in *THE AGRICULTURAL GAZETTE* of Canada, March, 1916:

The pastures, which are the basis of our dairying industry have been very poor throughout the summer and have only started to recover under the fall rains.

A COMPARATIVE STATEMENT 1911 TO 1915

During the five-year period, 1911-1915, the number of factories decreased by 82. This is no decrease, however, as a large number of small factories have been turned into creameries, stations, or amalgamated into one large establishment.

In 1911, according to the federal census, the total value of milk was \$31,663,220, while the value of butter and cheese manufactured in factories, was \$15,656,986, or in round numbers 50 per cent of the total value of milk. Applying the same comparison to the total value of butter and cheese manufactured, and the total value of milk, the following figures are arrived at:

Value of butter and cheese manufactured in 1915: \$17,302,400.

Estimated value of butter and cheese in 1915: \$35,000,000.

EXPORTS OF MILK AND CREAM

Finally, the rapid increase in milk and cream exports in the course of six years will be noted in table II. In 1910, this exportation amounted to \$150,782, while in 1915, it amounted to \$1,455,420, or an increase of nearly 1,000 per cent. The last figures are taken from the report of the Customs Department for 1915:

TABLE I.—BUTTER AND CHEESE MANUFACTURED AT VARIOUS PERIODS
(TEMPORARY FIGURES FOR 1915)

	1915	1914	1911	1901	1891	1881
Butter factories, number	690	680	787	445		
Cheese factories, number	940	887	1,062	1,207	728	
Butter and cheese factories, number.	520	380	293	340		
Cows, number	540,400	504,129				
Butter, quantity manufactured, lb.	32,994,680	34,015,265	41,782,678	24,625,000		
Cheese, quantity manufactured, lb.	52,590,222	56,185,251	58,171,091	80,630,193		
Average price per pound of butter	29 55	25 69				
Average price per pound of cheese.	13 86	13 20				
Total value of butter manufactured	9,904,400	8,788,277	9,961,732	4,916,756		
Total value of cheese manufactured	7,398,000	7,367,745	5,695,254	7,957,621		
Total value of butter and cheese manufactured	17,302,400	16,156,022	15,656,986	12,874,377		

TABLE II. - VALUE OF MILK AND CREAM EXPORTED TO THE UNITED STATES
FROM 1910 TO 1915

	1915	1914	1913	1912	1911	1910
Condensed milk and cream	383,824	48,490	111	40,797	71,752	150,782
Sweet milk and sweet cream	1,071,596	635,864	481,828	436,317	1,202,972	
Total	\$1,455,420	\$684,354	\$181,939	\$487,114	\$1,274,724	\$150,782

ONTARIO

RURAL SCHOOL FAIRS

BY C. F. BAILEY, B.S.A., ASSISTANT DEPUTY MINISTER OF AGRICULTURE

THE Rural School Fair movement in Ontario is gaining in popularity each year. This is evident from the fact that while 234 school fairs were held in 1915, plans are now under way for 268 fairs, which include 2594 rural schools, or 61,000 children. The aims and objects of the school fair work in Ontario have been fully outlined in previous issues of THE AGRICULTURAL GAZETTE so that no reference need be made to that phase of the work. However, the following regulations governing the work may be of interest:

ORGANIZATION

School fairs must be separate and distinct from county or township fairs. The Department will not assist in financing fairs conducted in any other way, unless special permission has been granted.

Group your schools in districts, including not more than 12 in each.

SCHOOL FAIR BOARDS

A school fair board composed of 3 children should be formed in each school, to

be chosen by vote of the pupils. The pupil receiving the highest number of votes shall be the chairman of the board.

SCHOOL FAIR ASSOCIATIONS

A school fair association should be formed in each district, composed of the chairmen of the school fair boards in the district. They should meet at some central point and select a president, vice-president, secretary and treasurer. The others shall be known as directors. The District Representative shall be the manager of the school fair association.

All work in connection with the fair should as far as possible be divided up among committees of the fair association, so that the District Representative will have no special duties to perform, but have general supervision in co-operation with the teachers and school inspectors.

A financial statement of each association should be prepared each year and a copy supplied to each school in the district.

ANNOUNCEMENTS

Dispense with the printed announcement. Send a circular (duplicator) to each school, giving list of crops, number of settings of eggs allowed, etc. Do not include directions as to growing plots or raising chickens. These should accompany seed and eggs.

SEED

Have each school select the same number of each crop.

Five girls in each school may have flowers, provided they also have a plot or setting of eggs.

Only products from seed supplied by the

Oats.	1 rod x 2 rods,	$\frac{3}{4}$ lb. of seed
Barley.	1 rod x 2 rods,	1 " " "
Potatoes.	4 rows each 18 feet long,	5 " " "
	30 inches apart,	or 56 sets
	plants 15 inches apart.	
Mangles and Turnips	4 rows each 18 feet long,	1 package
	30 inches apart,	
	plants 15 inches apart.	
Corn	4 rows of 5 hills,	1 cob
	40 inches apart each way,	(use seed from centre
	8 kernels per hill.	of cob.)
	(Weed out four weakest plants.)	
Beets, Carrots, Onions, Parsnips	4 rows each 18 feet long,	1 package
	20 inches apart.	

Department may be exhibited at school fairs.

Typewritten instructions as to size of plot and growing of crop should be put in each bag of seed. Flower and vegetable seeds supplied by this Department will have printed directions on the package.

Following are the sizes of the plots and the amount of seed required:—



BOYS AND GIRLS ARE BEING INTERESTED IN AGRICULTURE THROUGH THE SCHOOL FAIR

EGGS

Typewritten directions for hatching, etc., should accompany eggs.

Only 3 settings of eggs will be allowed each school. The pupils to receive same should be decided by vote of the school. Each pupil receiving a setting will pay 25 cents, to go to the school fair association. Do not demand a pullet from each child receiving eggs.

If other pupils desire eggs, you may, on order from their parents, supply same from any source, provided that the price is not more than 5 cents per egg. Expense of delivery will be borne by the Department, but the parents must pay the cost price of

the eggs. Birds from these eggs will be eligible for entry at the school fair.

INSPECTION

Where possible the chairman of the school fair board should accompany the District Representative when he is inspecting the plots of the pupils in the school.

PRIZE LISTS

Prize money should be secured locally. Three to five dollars from each school should be sufficient. County and township councils should also be approached.

To secure more uniformity in prize lists

throughout the province, it has been decided to adopt the kind used by R. S. Duncan, District Representative for Durham County. If possible have all your prize lists printed at the same time and place.

Where calves and colts are included in the prize list there should be a regulation stating that the animals be halter broken and shown on the halter by the exhibitor.

The teacher and parent must give a certificate that the manual training and cooking has been done by the pupil.

In addition to holding sports during judging of exhibits, part of this time might be used in conducting competitions that would be interesting to spectators, for example, poultry plucking, plain sewing, public speaking, etc.

number required, so that you may have them to distribute with the seed and eggs. Badges, prize ribbons, and entry tickets will be supplied by the Department.

CHEQUE FORMS

In some counties the teacher in each school was entrusted with funds equal to the total winnings of the school. Cheques were issued to the children and cashed by the teacher. If you desire to adopt this scheme, cheque forms will be supplied by the Department upon application.

SEEDS AND EGGS PURCHASED FOR SCHOOL FAIR WORK

In past years each District Representative has purchased the seed and



SCHOOL PARADES ARE BECOMING AN INTERESTING FEATURE AT MANY SCHOOL FAIRS

DATES OF FAIRS, JUDGING, ETC.

To facilitate the judging at fairs the counties will be grouped in twos. Consult the other Representative before arranging dates of fairs.

Where a school fair is said to conflict with a township fair an effort should be made to hold the school fair a week or ten days later than the fall fair.

At least ten minutes must be devoted to judges giving reasons for placing awards and discussing the exhibits in general.

In no case shall an entrance fee be charged at school fairs.

SCHOOL FAIR PINS

School fair pins will be supplied to all children not included in the work last year. Notify this office as soon as you know the

eggs required for the school fairs in his county. The orders being somewhat small retail prices had to be paid. In order to overcome this difficulty all material was purchased this year through the head office. This plan has resulted in increasing the standard of the material purchased and reducing the cost to a very considerable degree. Early in the year requisitions were received from each office giving a list of the kinds, varieties and amount required. From these requisitions a complete list was prepared and tenders called for. The following is a list of the seed and eggs purchased:—

Barley	O. A. C. 21	74 bus.
Oats	O. A. C. No. 72	170 bus.
	O. A. C. No. 3	
	Banner	
Wheat	Marquis	25 bus.
Sweet Corn	Golden Bantam	7 bus. on cob
		16 bus. s elled
Field Corn	Wisconsin No. 7	61 bus. on cob
	North Dakota	
	Golden Glow	
	Longfellow	
	Compton's Early	
	White Cap Yellow Dent	
	Bailey	
Field Peas	Arthur	4 bus.
	Prince Albert	
	Early Britain	
Potatoes	Delaware	1,147 bus.
	Davies Warrior	
	Empire State	
	Canadian Standard	
	Green Mountain	
	Early Eureka	
	Irish Cobbler	
Turnips	Carters Invicta	3,484 packages
	Gartons Model	
	Purple Top Swede	
	Good Luck	
	Gartons Keepwell	
	Hartley Rouge Top	
	Kangaroo Swede	
Mangels	Yellow Leviathan	8,103 packages
	Yellow Intermediate	
	Bruces Giant	
	Our Ideal	
	Mammoth Long Red	
Beets	Detroit Dark Red	2,822 packages
Carrots	Chantenay	3,951 packages
Onions	Yellow Globe Danvers	2,429 packages
Parsnips	Hollow Crown	485 packages
Asters	Giant Comet (mixed colours)	10,711 packages
Sweet Peas	Giant Spencer Hybrid (mixed colours)	4,819 packages
Pansies	Giant Trimardean (mixed colours)	680 packages
Cosmos	Early Flowering (mixed)	350 packages
Phlox	Drummondii (mixed)	1,395 packages
Nasturtium	California Giant (mixed)	340 packages
Petunia	Large Flowering (mixed)	250 packages
Eggs	Barred Rocks	8,058 dozen
	White Wyandottes	
	Rhode Island Reds	

While it is always desirable to have first class seed for work of this kind it is equally important to have seed of varieties especially suited to each particular district. The list of the various crops given above would seem to show that the list of popular

varieties is not particularly large, and would no doubt be a fair guide to those who may be purchasing seed for a school fair or any similar work. All the small seeds were put up in paper packages as per sample:

ONTARIO
Department of Agriculture

**RURAL
SCHOOL FAIR**

B E E T
DETROIT DARK RED

CULTURE.—Sow the seed in fine soil as early in the spring as possible. Thin out young plants to three or four inches apart. Keep down all weeds between the rows. They may be stored for winter use, after the tops have been twisted off by hand, in a cool cellar.

It will be noted that printed directions were given for the growing of each crop. Another year it is intended to include on the package the size of the plot and any other information that may be of value to the children.

It is encouraging to note the added interest each year in the school fair movement in Ontario as the work becomes better understood. Teachers, children and parents are all keenly interested in having the work continued. While the increase in the number of fairs for 1916 is fairly large, the number would have shown a greater increase had it not been for conditions resulting from the war.

MANITOBA NOTES

LIVE INTEREST IN MANITOBA WEED QUESTION

Never before in the history of Manitoba has there been such general interest in the weed question. This is partly because of the alarm that has naturally followed the rapid spread of perennial sow and Canada thistles, together with the serious problem of couch grass; and it is partly due to the activities of the weeds commission. During the past two or three months, five thousand copies of the revised Noxious Weeds Act have been put into circulation, and demands for still more copies are rolling into the office of the Commission.

One feature of the Act that will be more carefully looked after than hitherto will be the cleaning of threshing machines as they move from farm to farm. Extracts from that part of the Act relating to the duty of threshermen are being printed, so that they may be affixed to the threshing machines of the province. As there is a penalty for failing to affix the notice, the farmer will be largely to blame if the machines do not carry placards, and if this part of the Act is not enforced.

FIRST LOT OF COWS DISTRIBUTED

The first lot of cows to be turned over to their new owners under the "Winkler

scheme" were distributed on May 30 and 31 at Inwood and Norris Lake, Manitoba, when a shipment of 100 head, including cows and calves, were delivered. In every case these cows were either milking or were soon to have calves. From three to five cows to a farmer was the usual number delivered, and the price to the farmer averaged close to \$75. All these animals were purchased within Manitoba.

In many cases the farmers (mostly non-English) who received these cows, though possessed of plenty of grass land, log buildings, and in some cases stacks of hay, had previously been in too poor circumstances to buy cattle to keep on the land. In every instance they were well pleased with the animals. It is the policy of the Department agents to purchase the animals with care, and deliveries to other centres from which satisfactory applications have been received will follow in due course.

SHORT COURSE FOR RURAL MINISTERS

The Manitoba Agricultural College has arranged a short course for rural ministers. The dates selected are from July 17th to July 28th. Among the special speakers announced are Rev. Dr. S. G. Bland; Mr. R. C. Henders, President Manitoba Grain Growers' Association; Dr. W. A. Mc-

Intyre, Principal of the Normal School; Dr. A. W. Allum, and Mrs. B. Dahl Laws, of Appleton, Minnesota.

DEMONSTRATIONS IN SHADE TREE SPRAYING

Last summer was decidedly the worst season for insect damage to shade trees that Manitoba has experienced for some time. In some districts the canker worms ate the leaves almost entirely from the maple trees, and almost killed them. They were not, however, distributed over all the province. But in every part of Manitoba plant lice were abundant, and between their depredations and those of other insects, the shade trees in many parts of the country had a very hard time of it.

This year the Horticultural Department of Manitoba Agricultural College has

launched a vigorous crusade against the tree pests. Already two popular posters have been distributed throughout Manitoba.

One of these posters, mostly mailed to points in Southern Manitoba, deals with the destruction of the canker worm. This insect has killed some splendid groves in this province. The worms are poisoned by arsenical preparations, notably by Paris green and arsenate of lead, the formulæ for which appear on the poster.

The other poster deals with plant lice destruction by nicotine solutions and kerosene emulsion.

In addition to the use of literature, Mr. J. A. Neilson, B.S.A., Assistant Professor in Horticulture, toured Southern Manitoba during May and early June and gave a number of public demonstrations in tree spraying.

SASKATCHEWAN

WORK OF CO-OPERATIVE ASSOCIATIONS

THE annual report of the Co-operative Organizations Branch has just been compiled. On May 1, there were 261 associations registered under the Agricultural Co-operative Associations Act. The following statistics in regard to the business transacted during 1915 will be of interest.

The 173 associations that have reported on the business done by them during 1915 have a total of 5,537 shareholders, and a total paid up capital of \$39,421.49. Their total assets amount to \$105,322.37 and their total liabilities, including paid up capital, amount to \$82,956.57.

The returns show that 138 associations engaged in co-operative purchasing of farm supplies; one association confined its activities to the marketing of live stock; nine asso-

ciations engaged in live stock marketing along with other lines of business. Nineteen associations, the majority of which were organized during November and December, did not transact any business during 1915.

It is evident that wide-spread interest is being taken in co-operative live stock marketing. In 1914, nine associations marketed stock; 50 carloads were sold and the net proceeds amounted to approximately \$42,000. In 1915, ten associations shipped stock co-operatively; 140 carloads were handled and the net price realized was \$150,512.76. The following data compiled from special reports supplied by the managers of six associations give some idea of the work carried on and the savings effected:

NAME	Number of Cars	Number of Shippers	Weight Lb.	Manager's Estimate of Increase in Price Per Lb.	Amount Saved
Guernsey Co-operative Association, Limited	8	72	137,590	3/5c.	\$825 54
Lloydminster Co-operative Association Limited . . .	57	293	876,380	1 1/2	2,921 27
Maldstone Co-operative Association, Limited	17	116	514,113	1 1/2	4,711 70
Rozilee Co-operative Association, Limited	9	80	130,562	1 1/2	652 81
Watson Co-operative Association, Limited	18	147	372,040	1 1/2	5,580 60
Young Co-operative Association, Limited	9	119	112,181	1 1/2	1,682 71

The total value of other farm produce marketed was \$8,923.03, and the total value of farm supplies handled was \$805,456.88. Considering the small amount of capital

invested the turnover during the year is most gratifying, and the net profit of \$19,102.27 on a paid up capital of \$39,421.49 is very satisfactory.

LEGISLATION GOVERNING CREAM BUYING STATIONS

THE Department of Agriculture has found it necessary to issue regulations governing cream buying stations. These stations have recently become quite numerous, and are generally to be found in small stores in country places, where there is no proper provision for the handling of the cream. Very few have proper testing appliances, and no precautions are taken for storing the cream without deterioration until it can be shipped. The result is that first of all the farmer is not likely to get the full price for his product, and, secondly, very inferior cream is shipped, from which it is impossible to make good butter.

Before a license to conduct a cream buying station will be granted,

the applicant must show that he has a suitable building or room to be devoted exclusively to this purpose, with walls of a certain construction, and floor properly sloped and drained. Cream must be bought by weight. Samples for testing must also be weighed, and not taken by the pipette system, under which, if the cream is frothed, the receptacle holds up to one-third less than its correct content, to the farmer's loss. Cream cooling tanks for the keeping of cream awaiting shipment must also be provided. Cream has frequently been observed at these stations in ordinary cans at the back of a store, or in a butcher's shop, where it is bound to deteriorate very rapidly.

ALBERTA

EXTENSION WORK

BY H. A. CRAIG, B.S.A., DEPUTY MINISTER OF AGRICULTURE

IN sympathy with the established policy of the Alberta Department of Agriculture, to promote efficiency by early training, a corps of district agents is in the field this spring at various points in the province. Satisfactory organization work has already been accomplished.

and horticulture. The Minister of Education is endorsing the plan and is co-operating to the extent of making the time of the classes in school available to the agents for the carrying on of instruction and direction in the work.

PURPOSE

The purpose of the work is to give explicit and practical teaching to school boys and girls in agriculture

THE PLAN

The Department is counting on giving effect to the work by engaging the pupils in the actual growing of garden crops and chickens and in

feeding and management of young stock on their own farms. In essence and in its largest feature it is education through the child's home garden. Initial group instruction in the laying out and planning, and in the general cultivation of the garden is given in the schools. Leaflets, seeds and bulletins are also distributed in the schools. Seeds are given free and consist of potatoes, peas, parsnips, mangels, beets and carrots.

The work with chickens consists of the raising of broods of chickens from eggs furnished from the provincial poultry plant. Only a limited number of these are given out and to pupils recommended by the teachers. Competitions are carried on likewise in the care of larger stock such as calves and colts. Dairy heifer calves and beef heifer calves and steers are included in the prize list. The prize for colts relates to the care and condition, but principally to the education of the animal. Prizes are to be offered for cooking, but it is not expected that much instruction can be given this year.

During the season, the district agent will continue to instruct with regard to cultivation, diseases and trouble of various kinds in co-operation with the teacher and inspector, but close individual instruction will also be given. Each agent becomes a resident at a home garden centre for the season, and is furnished with a car to go about from farm to farm, or from school to school. While the

work is primarily and principally home garden work for boys and girls, the district agents will function as general helpers and advisers to the whole farm community, in relation to their tillage, crops, live stock and marketing interests. In fact, the work is expected to lead to effective rural community organization with respect to the whole industrial, business, educational and social life.

THE FALL FAIR

The season's work culminates in a fall fair. Where the date and location are favourable this will be held in conjunction with the district fair; otherwise at the most convenient school or village centre. It is generally thought that the greatest popular interest and support will be secured by combination with the district fair.

EXTENT OF ORGANIZATION

There are five centres in the first season: at Vermilion, Olds, Claresholm, Stony Plain and Sedgewick. About a hundred schools are in the organization this year. The instructors of the provincial schools of agriculture are in charge.

The Department of Education is adopting a vigorous policy of instruction through classroom and school garden work, and the officials of both Departments have good hopes of being able to supplement each other's work effectively.

RURAL HIGHWAYS

BY J. D. ROBERTSON, ENGINEER OF HIGHWAYS

THE construction of highways in Alberta is undertaken by the Provincial Department of Public Works, under the direct supervision of an engineer of highways. The policy of the Department is to develop a provincial system of trunk roads, supplemented by a system of main roads.

The trunk roads of the province consist of one main central highway, running north and south through the province, connecting the principal cities. This road has already been constructed for a distance of about five hundred miles, extending as far north as the main settled portion of the province.

There are also six trunk roads crossing the province from east to west, parallel to the main railway systems of the province, laid out, the greater portion of which have been constructed; the remaining portions are under construction during the present year. The total length of trunk roads constructed at the present time is approximately 2500 miles. These roads are constructed entirely by the Department of Public Works, and their maintenance is largely provided for from the same source.

The main road system of the province consists of roads extending approximately at right angles to the different railways, and leading from the various shipping points and trading centres into the farming communities and forming cross-connections between the different lines of railways. The cost of construction is borne by the local improvement districts and rural municipalities through which these roads pass, assisted as far as possible by funds provided by the Department of Public Works.

As these roads, in the first instance are merely made passable by having the worst portions of them improved, and afterwards gradually brought up to a better condition, growing year by year, both in completeness of construction and in extent, it is impossible to say at any time the amount of mileage covered by these main roads.

The Department of Municipal Affairs of the province has divided the province into certain units of areas for the purpose of local organization. A good many of these are organized as rural municipalities, certain others are organized as local improvement districts, while a considerable portion of the province still consists of unorganized units.

The finances of the municipalities and local improvement districts are administered by themselves, and their

work in road construction consists largely of providing access to the main roads passing through their territory.

In the unorganized units the moneys collected from taxation of land are administered by the Department of Public Works as a trust fund and are devoted to the same purpose.

The steel bridges constructed on the main roads and trunk roads of the province over streams and rivers are, without exception, constructed by the Department of Public Works.

The principal wooden bridges are also constructed by the Department of Public Works, as the purchase of lumber and the construction of a truss bridge or pile bent structure are usually too expensive for our municipalities in their present condition of development. Small bridges that can be built by unskilled labour, from local material, are frequently constructed by the municipality.

The rapid development of the country in the way of settlement and the extent of the roads required to form outlets for the settlers produce a constant demand for road construction of a pioneer nature. This, with the lack of good road building material, accounted for by the extent of good agricultural country, renders permanent road building somewhat difficult.

A great deal has been accomplished, however, in the ten years which have elapsed since the formation of the province, during which period the Provincial Government have expended on roads, bridges and ferries \$8,500,000, the expenditure by the local improvement districts and rural municipalities for the same period being approximately \$5,000,000, making a total expenditure in ten years of \$13,500,000, and another decade should see the road system of Alberta advanced a long way towards completion.

PART III

Rural Science

HOME SCHOOL GARDENS

A good deal of attention has been given in THE AGRICULTURAL GAZETTE to gardens in school grounds, but comparatively little has been published with respect to school gardens at home. These are operated, to a greater or less extent, in practically every province, but the method of conducting them is by no means uniform. In order to bring together all available information on this subject, the responsible heads in the various provinces were asked to deal with it under the following points: Limitation of area; crops grown; how seed supplied; part played by teachers, district representatives, school inspectors; frequency and method of inspection; number of gardens per school; number of schools per group; number of groups in the province; provision made for pupils to systematically visit each other's garden; how associated with work of classroom; rewards for merit; penalties for neglect; disposition of produce, noting a few specific instances of results. The replies received follow:

PRINCE EDWARD ISLAND

BY H. H. SHAW, ACTING SUPERINTENDENT OF EDUCATION

LIMITATION OF AREA

The area devoted to home gardens is not limited in any way. The size of the plot is left to the judgment of the teacher or parent and the child undertaking the work. It varies considerably from small plots of twenty to thirty square feet up to quite large gardens.

CROPS GROWN

The crops grown consist chiefly of the common flowers—asters, sweet peas, nasturtiums, etc., vegetables—cabbage, carrots, peas, beans, etc., and field crops—potatoes and turnips chiefly. Some school children attempted the production of home grown root and vegetable seed—turnip, mangel and cabbage—and a number of them were quite successful.

HOW SEED SUPPLIED

The School Supply Department, Charlottetown, supplies flower and vegetable seeds at cost. Potatoes and grain were obtained at home or from the Dominion Experimental Station, Charlottetown.

ASSISTANCE AND SUPERVISION

The extent to which the home project work in any school was taken up depended largely upon the teachers. They brought to the attention of the school children the value, usefulness and attractiveness of home gardens. They helped as far as they could to solve the difficulties that arose in the home garden work. They are required to visit the home gardens during the season, and are expected to make use of the home garden in the regular work of the school for some definite, practical, educational purpose.

The District Representatives assist in the home garden work by meeting the teachers and inspectors at the Teachers' Conventions, the Summer School and in other ways, and explaining the preparation of the soil, the planting of the garden, etc., and offering suggestions and answering questions regarding home garden work. Schools are sometimes visited in company with the school inspector, questions asked regarding home garden work, and a short talk given in this connection. The District Representatives are ready to give assistance and answer questions regarding home gardens.

The school inspector explains the nature of the work, encourages the teacher to take it up, and as he visits the schools from time to time, he offers suggestions regarding the carrying on of the work to suit local conditions. By visiting some of the home gardens, questioning the children about their work, inspecting the records they have kept and in other ways, the inspector is able to determine the value of the work done along this line.

Very little provision was made for pupils to systematically visit each other's garden in 1915, but it is to be hoped that a number of schools

will adopt this plan this year. Much information of value to the boys and girls could be secured in this way. In addition the desire to improve and excel would be developed, and greater interest would be taken in the work.

ASSOCIATION WITH THE WORK OF THE CLASS-ROOM

Some teachers make a great deal of use of the home gardens in the class-room in English composition, arithmetic, drawing, botany and agriculture. There are other teachers who make very little use of home gardens in the class-room. It will depend largely upon the teacher's interest in the work.

DISPOSITION OF PRODUCE

Vegetable and flowers grown in home gardens were used in the home of the child as a general thing. Some of them would be taken to school for class-room study. In one section (Souris) an exhibit was made at the fall fair of roots and vegetables grown in home gardens. At one school, Charlottetown, the girls were organized into a Progress Club and they sold the flowers which were grown and gave the proceeds for patriotic proposes.

NOVA SCOTIA

BY L. A. DEWOLFE, B.S.A., DIRECTOR OF RURAL SCIENCE SCHOOLS

HOME gardens are becoming increasingly popular. The area is left wholly to the choice of the owner, but we encourage children not to undertake more than they can care for. Some towns offer local prizes for well-kept home gardens. In such cases, each town specifies the size of plot, which is usually about 300 square feet.

Under the rural science scheme, children are allowed to grow whatever crop they choose. They are advised to include a few vegetables and

flowers not commonly grown on their farm. Thus they increase the variety, which, in most kitchen gardens, is too meagre.

In a few localities, children are limited to a few kinds of flowers and vegetables for exhibition. This makes easier work for the judges. But, on the other hand, it interferes with the initiative of the children. Local organizations usually select well-known flowers and vegetables. Thus the children learn only cultural methods. If the same cultural meth-

ods are applied to something new, there is the added pleasure of forming new acquaintances. And, after all, we feel the children are worthy of greater consideration than the judges.

Children buy their own seed. Where the home garden movement is new, the Government supplies seeds in small quantities merely to introduce such work.

The success of the work depends on the teacher. Our teachers follow the children's hopes and plans; and by various means, keep the lagging ones "up to time."

In most cases, the teachers see the gardens two or three times a year. If no garden prize is offered, the produce is frequently the only thing inspected; and that, of course, is done at the exhibition. To be sure that the produce came from the child's own garden we are trying out various checks. One promising one is to have high school pupils supervise the gathering of produce, and to recognize it again at the exhibition. To avoid dishonesty even here, the supervisors must themselves be exhibitors.

Where the garden work is best organized, a committee of citizens

inspect the gardens and arrange exhibition details.

In schools taught by rural science teachers about 75 per cent of the children (except in the lowest grades) have gardens. The number of gardens per school depends, therefore, on the size of the school. The average is about 20 gardens per school in 125 schools, or 2500 gardens in the province.

Our schools are not grouped for garden purposes. In three localities we have exhibition centres including a dozen schools each. Elsewhere, the only grouping is by counties for the county exhibition.

Teachers are doing their best to associate the garden with class-room work. English, arithmetic, and drawing fit well into our crowded time-tables. To be sure, many of the teachers are still wedded to book problems, but methods are changing as rapidly as we can expect.

The only rewards of merit are the produce itself and the exhibition prizes. The only penalty for neglect is the lack of these things.

Produce is used at home, except in a few cases where it has been given to hospitals or sold for patriotic funds

NEW BRUNSWICK

BY R. P. STEEVES, M.A., DIRECTOR OF ELEMENTARY AGRICULTURAL EDUCATION

THUS far the policy of the Elementary Agricultural Education Division of the Department of Agriculture in this province has been to establish on the school grounds at every school a garden varying in extent according to the number of pupils enrolled there. This serves as a piece of apparatus, a laboratory for practical and experimental study of the elementary principles of nature study and agriculture. Another object we have in view in carrying out this policy is to promote better care of school grounds, to cultivate taste and appreciation for the beautiful,

to inculcate the idea that the school property owned by the community indicates the standard of local patriotic sentiment. These features should appeal to town, village and rural sections. It is our purpose to have them so appeal with increasing power from year to year.

The home plot or garden follows in logical sequence this idea. As all school work is a preparation for living, so the knowledge and training secured in this practical way find application in home and community effort. In the home garden the pupil while still at school, where he can have the assistance and super-

vision of the teacher, and the co-operation of the parents—whose sympathy with school work is thereby enlisted—undertakes to put into operation what he has learned and to acquire still further knowledge and experience.

During 1914 there were of such home plots or gardens 59, in 1915, 378, and this year, though we have not absolute data, we estimate the number at between 700 and 1,000.

These gardens vary in size from 640 sq. feet to 50 sq. feet and possibly some are smaller. On these, grains, vegetables and flowers are grown. Some divide a plot of 16 x 20 feet into four parts, and raise different products on each quarter, others raise but one crop. A large amount of freedom is permitted according to the direction of the pupil's own study, and the character of the productions the community is interested in. In all these gardens, pupils are encouraged by teachers to work out some experiment requiring observation, record keeping and study.

This Department supplies some seeds for such plots of which notice is given during the winter months. This year turnip, carrot, mangel and some potatoes, and wheat, oats, barley, buckwheat and corn were supplied. Seeds other than those above mentioned must be provided locally.

This work is largely optional. It is the outgrowth of the instruction given at school through the garden there.

The element of competition is being made use of. Teachers are advised to have not less than four pupils growing the same crop and working on the same experiment. No pupil is advised to undertake more than one experiment and all are expected to report to the teacher in the fall the results of their work, such report to be transmitted by the teacher to this Department.

The home gardens or plots carried on by the pupils of a school are to be visited by the teacher at least three times during the year, when the seed bed is fully prepared, at or near the close of the school term in June, and again as soon as possible after the summer vacation. The pupils are working away independently, except when they feel the need of advice and direction they consult the teacher. Suggestions at the time of visits are made by the teacher.

The produce of home plots is essentially the property of the pupil who tills the garden on which it is grown. Many pupils have disposed of their crops of last year and donated proceeds to some patriotic purpose. The same has been done in some cases with the produce of school gardens.

QUÉBEC

BY JEAN-CHARLES MAGNAN, B.S.A., ST-CASIMIR

HOME gardens are optional for children-gardeners in Quebec schools. They are encouraged wherever the schools do not have a sufficient area for garden work, or where the soil is not good enough for cultivation, for instance in rocky places, etc. They are also encouraged in districts where school fairs are organized by teachers.

Regarding home gardens, we are exactly of the same opinion as Mr.

H. W. Watson, director of elementary agricultural teaching for Manitoba, who said, in a recent article:

"The teacher that does not follow up gardens at school with those at home, fails to realize the purpose of the work and loses more than half the real pleasure and profit derived from it."

If the object of the school garden is to get the pupils interested in agriculture, we should make sure that pupils apply the school teach-

ings on the home gardens. Why is agriculture taught in the schools? What is the object? Chiefly to give the children a liking for things of the soil, to give them a desire to become farmers. When pupils go on at home with the work of the school garden and show an interest in the same, it may be safely inferred that agricultural teaching in the school has not been fruitless. There are seventy-one schools in our province, the teachers of which have greatly helped in the establishment of home gardens. Eleven groups of children-gardeners exhibited their products at school fairs in September

sure 4 x 16 feet. The vegetables grown are: carrots, lettuce, beets, butter beans, potatoes, parsnips, etc. Several children-gardeners also grow special plots of oats, barley and corn. Sheaves of these selected cereals and corn ears are shown at school fairs in September and October. Each pupil must present a report at this fair. A prize is given for the best report on the work of the home garden.

Pupils obtain plants and seed from the school or from their parents. At the school fair of St-Casimir de Portneuf, thirty-three children-gardeners produced reports, each con-



SCHOOL PUPILS IN THEIR HOME GARDENS, ST. CASIMIR, QUEBEC

and October, 1915. These home gardens are directed and visited by the teacher, a District Representative, a school trustee or some other person detailed for this work.

We also share the opinion of Mr. Watson, who says further on in the same article:

"The home gardens are of considerable value to the interested teacher. They furnish a splendid opportunity for visiting the home socially, and reaching the parents as no other excuse would do so successfully, impressing facts taught at school, correcting errors, suggesting improvements, instilling higher ideals of taste, encouraging original and independent experiments."

Our home gardens generally mea-

taining at least two hundred and fifty words. These reports give ample evidence of the fact that those children love agriculture, that they are interested in the work of the soil, and that their young intelligence is attracted by the same.

The efficiency of the school garden may be judged when visiting the home garden. If the children show their gardens with pride, if they take deep interest in the same, if they ask questions on horticulture, it may safely be inferred that the home garden is the logical consequence of the teaching that is given at the school garden and in class work.

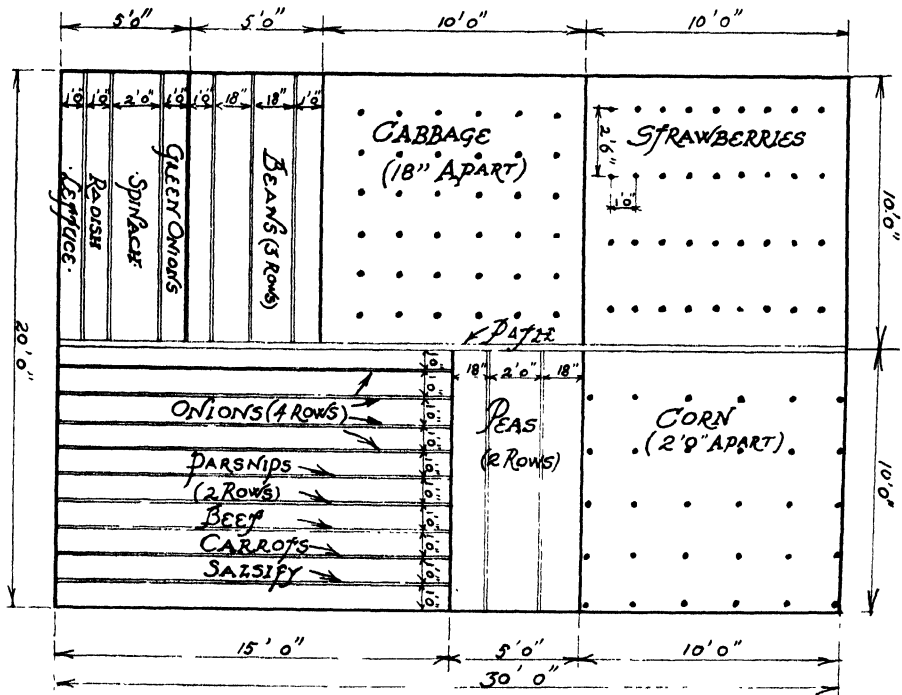
ONTARIO

A HOME GARDEN CONTEST

BY C. F. BAILEY, B.S.A., ASSISTANT DEPUTY MINISTER OF AGRICULTURE

DURING the past few years the Rural School Fair movement in Ontario has made very rapid progress, and has undoubtedly done much to interest the boys and girls in the study of agriculture. It was felt, however, that some effort should be made to hold the interest of the boys who have left the public schools and were unable to take part in the school fair

first, boys having reached the required age for this contest are capable of undertaking more than is called for by the children taking part in the school fair work; second, it is well known that a garden is far too uncommon on the average farm. In fact a greater number of vegetables are to be found in the back-yard gardens of our cities and towns than can be found on the average farm.



PLAN OF HOME GARDEN SUPPLIED TO EACH CONTESTANT

work. With this in mind the Department has made plans through the District Representatives to conduct a home garden contest, open to boys between the ages of twelve and fifteen who have left the public school and have returned to the farm.

There were two main reasons for selecting the home garden contest;

It is hoped that the parents will be made to appreciate the importance of a kitchen garden as a result of this contest.

Owing to conditions resulting from the war it was left optional with each District Representative whether or not he should conduct this contest. However, it is pleasing to note that

this contest will be conducted this year in twenty-five counties in the province.

The following are the rules governing this contest:—

1. Twenty-five gardens will be allowed in each county.

2. Select boys between the ages of 12 and 15, preferably those not attending the rural school and not taking part in the school fair. Where possible, select boys who have been prominent in school fair work.

3. Each garden will be 30 by 20 feet.

4. The following will be grown in each garden:—

Strawberries, corn, cabbage, peas, beans, onions, green onions, spinach, radish, lettuce, parsnips, beets, carrots, salsify.

5. The seed will be supplied by the Department.

6. A blue print showing size of garden and arrangement of crops will be supplied to each contestant, also directions as to preparing the land, planting, care, etc.

7. The District Representative will inspect the gardens. Score cards as printed below will be supplied for this purpose.

8. Ten dollars from the county grant should be used for prize money, divided as follows,—1st prize, \$5; 2nd, \$3; 3rd, \$2.

9. If possible, arrangements should be made with fall fair boards to award prizes for crops from these gardens. It is doubtful if the crops grown in these gardens could be exhibited at the school fairs.

THE SCORE CARD

In the inspection of the gardens the following score card will be used by the District Representatives:

SCALE OF POINTS	Possible Score	Contestant's Score
General appearance:—		
Straight, even, well-filled rows	10	
Correct size of plot and arrangement of crops	10	
Freedom from weeds, diseases and insects	20	
Cultivation and care of plants	20	
Quality of vegetables, uniform in size and shape	10	
Yield (approximate)	30	
Total	100	

Judging from the interest taken in the home garden contest there is every reason to hope that it will become a very important factor in interesting our young people in

agriculture, and creating a keener appreciation of the importance of a kitchen garden in the minds of the farmers of the province.

MANITOBA

BY H. W. WATSON, M.A., DIRECTOR OF ELEMENTARY AGRICULTURE

IN Manitoba, the large majority of schools with gardens have such upon the school grounds. In some cases the gardens are in a vacant village lot, or in the corner of a field adjacent to the school ground. Emphasis is laid upon the garden being at, or in close proximity to the school, but at the same time gardens at home as an extension of the work have always been encouraged. As the

school garden movement has been extended and greater success has been attained, a greater number of gardens at home have been established and maintained. Wherever there are the best school gardens, there are also the best children's home gardens.

The size of a child's home garden depends upon the size of the child and the land available; it varies then in area from 10 square feet in a village

lot to half an acre on a farm. The crops grown vary considerably also and include potatoes, corn (fodder and husking) seed grains, common vegetables and flowers.

Much material including grains, potatoes, corn, peas and beans is furnished free by the Departments of Education and Agriculture; other supplies are procured by the teachers at wholesale prices, paid for by the School Boards and distributed to the children.

In most cases the gardens are inspected and judged twice, immediately before and after holidays.

The teachers usually arrange the Boys and Girls' clubs and distribute the material among the children. The District Representatives distribute the free material from the Department of Agriculture among the teachers, give advice to the children and act as judges at the school fairs. School Inspectors organize and conduct municipal

school fairs and assist in the judging.

The number of children's gardens in a school district will vary from 10 to perhaps 50, and the number of schools uniting to form a group will vary from two to upwards of thirty in some municipalities. About seventy-five groups or clubs are organized for this year.

The work of the gardens and the materials grown furnish exercises for the class-room in reading, spelling, composition, arithmetic, drawing, nature study and agriculture.

Prizes are always awarded for the best kept gardens and for the best products exhibited at the school fairs.

The products of the home gardens have in the past usually been retained by the owners, but this year an effort is being made to induce all children to dispose of their garden products and donate the proceeds to the patriotic fund.

NORTHERN SASKATCHEWAN

BY FRED W. BATES, B.A., M.Sc., DIRECTOR OF SCHOOL AGRICULTURE

WHILE the home garden has not been developed as a special enterprise in Northern Saskatchewan, it has frequently been used where it was impossible to have a garden on the school grounds. The use of it in this way as a sort of makeshift does not give a fair idea of its value or possibilities, nor does it lead to any real object or aim in its operation. There is little use, therefore, in considering such instances unless one wishes to learn what to avoid.

There is one instance, at least, in Northern Saskatchewan where the home garden has been in operation for some time. Each year since 1912 the school board of the city of Saskatoon has organized a contest among the pupils of the city schools in home gardening. The competitors are divided into two classes;

pupils under thirteen years of age and pupils thirteen years of age and older, and a prize of \$5 given to the pupil in each class having the best garden. There is an additional prize given for special excellence along certain specified lines.

The work has been carried on by the pupils themselves with the exception of the initial spading of the plot, and a certificate to this effect, signed by the parent of the pupil, is required before any award is made. The pupils provide their own seed and no limit is placed on the variety to be used.

The organization of the scheme has been carried out by the Superintendent of Schools, the teachers of the various schools acting merely as judges in the preliminary stages of the work. Little effort has been made to relate the work to the class-

room exercises. The final judging has been done by a committee of expert gardeners.

Each year about one hundred and fifty pupils have entered the contest, and during September an exhibition has been held at each of the larger schools where additional prizes have been given for exhibits of flowers and vegetables grown in the home gardens.

The following simple rules govern the contest:

1. All work, except spading in getting the ground ready for seed, to be done by the pupils.
2. Garden to consist of two divisions one for flowers, one for vegetables, each to be of about the same size.
3. Minimum area of ground, 100 square feet. Pupils are advised not to attempt too large a garden as the quality of the garden is more important than the quantity.
4. At least three kinds of vegetables and three kinds of flowers must be grown.

The gardens are visited by the

judges twice—once in July and again in August.

In addition to the home gardens the School Board this year has secured ground adjacent to the various schools and a system of school gardens has been devised for the pupils not entering the home garden contest.

The continuance of the home garden scheme from year to year for so many seasons indicates its value, although the general arrangement of the work done in Saskatoon does not begin to suggest the possibilities of this phase of school gardening. Where the school garden has been graded to the age or ability of the pupil, a great deal of the more advanced experimental work should be carried on at home under the direct supervision of the teacher. In this way the work at school can be definitely and profitably linked up with the life and work of the home.

SOUTHERN SASKATCHEWAN

BY A. W. COCKS, B.Sc., DIRECTOR OF SCHOOL AGRICULTURE

FROM the interest being taken by the general public, teachers and pupils in school gardening, it appears that during the present summer gardens will be conducted on the grounds of at least eighty per cent of the schools in Southern Saskatchewan. Although this movement is not new, very little organized work has been attempted up to the present time and, therefore, it has been decided to confine our efforts, for this year at any rate, almost entirely to school gardens, that is, gardens on the school grounds. We hope to make this phase of the work really successful and permanent before attempting to encourage home gardens for pupils to any great extent, although, of course, our aim will lead us to such work eventually.

In a few cases home gardens are

being encouraged by teachers and rural education associations or other organizations. One of the most interesting instances of this is the work which has grown out of the Farm Boys' camp that was held in connection with the provincial fair at Regina last year. A contest in wheat-growing has been arranged for the boys who were present at the camp last year and to each boy one bushel of selected Marquis wheat has been forwarded, together with directions for seeding and cultivation and regulations respecting the contest. The boys are being asked to make observations from time to time during the growing season and to record the same. The work is under the supervision of the agricultural secretaries and will be generally directed by Prof. Bracken of the University of Saskatchewan,

who will endeavour to sustain interest in the experimental plots and assist the boys in studying questions of cereal improvement.

A few of the rural education associations recently organized in the southern part of the province have decided to organize clubs for boys and girls in potato-growing, sheep-rearing, etc. The arrangements for the potato-growing contests, in brief, are as follows: A definite amount of pure seed potatoes will be supplied by the association to each boy or girl becoming a member of the club. Directions for the cultivation of the potatoes, together with regulations governing the competition, will be supplied to each member of the club. The boys and girls will be asked to keep a record of their work, of the cost of production and of the weight and value of the product. The samples of potatoes will be exhibited in the fall at the municipal school fair and

prizes awarded to the successful competitors. In awarding the prizes the following points will be taken into consideration: cultivation of plot during the growing season; weight, quality and value of product; written record of work done.

Similar competitions in the growing of pedigree cereals, egg-yielding, etc., will be organized by other associations.

Although no general method for the marketing of the produce has yet been decided upon, it is understood that some of the associations intend to make arrangements on a co-operative plan for the marketing of all the eggs, cereals, etc., produced by the members of the clubs.

During the year the officials of the Department will be enabled to study such isolated projects in connection with home gardening and to formulate a policy, which can be recommended to all the rural education associations of the province.

In the United States, as in Canada, the desirability of school supervision of the home garden is thoroughly realized, a fact that is proven by the advantages thereof being set forth in a circular recently issued by the Bureau of Education at Washington. Home gardens contribute, the circular points out, to the income of the family; they utilize for productive purposes unused land; they provide experience for boys and girls; they provide exercise that vitalizes school work; they afford opportunity for the cultivation of business habits; they lead to the cleaning up of back yards and to a desire for orderliness and tidiness; they help to beautify city, town or village, and they add to the welfare of the community.

Both home gardens and school gardens have a foundation place in the life of the people and the more they are cultivated the more agriculture and the nation at large will be benefitted.

PART IV

Special Contributions, Reports of Agricultural Organizations, Notes and Publications

AGRICULTURAL RESEARCH IN CANADA

AT the annual meeting of The Royal Society of Canada held in Ottawa the third week in May, the president of Section III, Frank T. Shutt, M.A., D.Sc., the Dominion Chemist, delivered a learned and valuable address on agricultural research in Canada. He divided his subject into three parts, the first, The Status of Agriculture in Canada; the second, The Value of Science in Agriculture, and the third, The Improvement of the Practice of Agriculture in Canada through Education, Demonstration and Research.

Dealing with the first division of his subject, Dr. Shutt pointed out that agriculture was at once the oldest and most valuable of Canada's industries. It employed more people and created more wealth than all the other industries put together. By the census of 1911 Canada was shown to contain 7,206,643 inhabitants, of whom close upon 55 per cent were engaged in, or were dependent upon, agriculture; that less than 8 per cent of 1,401,316,413 acres comprised in the nine provinces of the Dominion was under cultivation as farm land; that the average annual value of field crops in the Dominion was \$650,000,000, while the estimated value of live stock was \$750,000,000; that the total value of dairy products in Canada in 1910 was \$69,500,000, which amount had been greatly increased since, and that the aggregate yearly value of agricultural products was at least 52 per cent of the total of all the country's products, including the forest, the mine, fisheries and manufactures.

EDUCATIONAL PROGRESS

The speaker contended that the foregoing facts abundantly established his contention as to the wealth and importance of agriculture. With a word of commendation for the attention that the federal and provincial governments were giving to the subject of his address, Dr. Shutt passed

on to speak of the progress that agricultural education is making in school and college. While agriculture was not a science in the sense that chemistry, biology and physics are, there is yet in a very real and vital sense a science of agriculture, towards the solution of the problems of which the other sciences contributed. The farmer is a director of agencies involving the life of the soil, the life of plants, the life of animals, and the sciences mentioned are an invaluable aid towards helping him to direct those agencies aright. Without the aid of those sciences agriculture made but slow progress. With the latter-day application of science to agriculture a better day had dawned. Chemists, biologists and physicists were all lending their labours with beneficial results. Farming indeed in many places had been almost revolutionized. The whole status of the agricultural industry had been improved and brought to a close standing with what had hitherto been termed the higher callings and professions. By the teachings of science soils have been made more productive, crops more prolific and more nutritive, cattle and their yields improved and enriched, hens made more fruitful. In short there had been advancement all round.

THE VALUE OF SCIENCE TO AGRICULTURE

Coming to the second part of his address, "The Value of Science in Agriculture," Dr. Shutt traced the history of clover and other leguminosæ to their present recognition as enrichers of the soil. Chemistry was the first of the sciences to be applied to an explanation of the manner in which plants and animals assimilate their food and to make clear the original sources of that food. Earlier theories had been abandoned in favour of the new light research had revealed. Here it is relevant and interesting to quote in full a couple of paragraphs:

"The analyses of plants revealed the

chemical elements of which they were composed; of these elements nitrogen was one. Analysis further showed, in connection with the problem we are discussing, that not only were the legumes richer in nitrogen, weight for weight of dry matter, than plants of other orders, but the further and astounding fact that they left the soil richer in nitrogen by their growth. Where did this additional nitrogen come from? What was its source? If from the uncombined, free nitrogen of the air, in what way did the legumes appropriate it? For by this time it had been fairly well established that crops in general could only obtain the nitrogen necessary for their growth from the organized nitrogen in the soil.

"Many chemists worked on this problem, prominent among whom was Gilbert of Rothamstead, England, who, with Lawes, for more than fifty years did such magnificent work in agricultural research, both in the laboratory and field, that they had placed the whole world for all time under a debt of gratitude for their work, above that of all others, had furnished the foundation of agricultural science upon which others of all nations have built and still are building. Unfortunately Gilbert just missed the solution of the problem, chiefly through imperfect apparatus. It was a great disappointment to him. The discovery was made by Hellriegel and Wilfarth, who conclusively showed that the legumes obtained their nitrogen, or in part at least, from the nitrogen of the atmosphere, not of themselves but through the agency of certain nitrogen-fixing bacteria in the soil and which attach themselves and reside in nodules or tubercles upon the roots of the legumes, passing on their elaborated nitrogen to their host—it appears to be a case of symbiosis—for the building up to its tissues of roots and stem and leaf. Without the aid of these bacteria the legumes, like all other plants, must draw upon the nitrates of the soil for their supply of this important element. As I was in England and Germany at this time (1888) I had an excellent opportunity of learning at first hand the various steps of this discovery, which, for its far-reaching effects, and the practical results that have followed, must be regarded the agricultural discovery of the century. It is interesting to note that Gilbert subsequently repeated Hellriegel's and Wilfarth's work and confirmed their conclusions."

BACTERIOLOGICAL WORK

Having proven the importance of the discovery of the value of clover, alfalfa and other legumes in cultivation of the soil, Dr. Shutt referred to the subsequent work of the bacteriologists. "Closely related," he said, "are the recent studies of the microscopic life of the soil and the relation

of this life to soil fertility. This is perhaps the latest phase of agricultural research, but already most valuable results to practical farming have been obtained. Soil bacteriologists, aided by chemistry, have established that the preparation of available food—and particularly of nitrogen—from the inert, insoluble stores of the soil, is the life function of bacteria. Other things being equal, we may perhaps say that the number of these useful microorganisms per unit of soil is a measure of the soil's productiveness. It is obvious that the working out of the chemical and mechanical treatments of the soil which will encourage the development of these organisms, is an important and valuable research. Occasional instances of failure to secure a "catch" of these legumes was traceable to an acid condition of the soil. It was now possible to test for acidity soils on which legumes were to be grown and to apply a remedy, where necessary, in the form of adequate applications of lime or ground limestone. Continuing, the doctor traced the progress of this research work and the beneficial influence it had had upon the improvement of the crops and the fertility of the soil, especially as regards cereals.

The history of experimental work with fertilizers was briefly reviewed. But little of a systematic nature had been done in Canada, although yearly the store of information in this direction was being added to. The belief was expressed that whereas, by means of a rational system for the maintenance of fertility—the keeping of sufficient live stock—a proper rotation of crops and thorough cultivation, the farmer might be made largely independent of expensive commercial fertilizers, yet, with the increasing cost of land and labour and the growth of intensive agriculture, a more extensive use of fertilizers might be expected. Similar influence had resulted on the requirements in animal economy and the digestibility and nourishing power of the nutrients in cattle feeds.

Next a reference was made to the effectual work in recent years of the entomologist and mycologist in the control of injurious insects and fungous diseases that attack crops—enabling the progressive farmer to adjust the proportions of his cattle-feed rations, according to the function—whether of beef or milk production—to be performed.

THE INFLUENCE OF EDUCATION

Passing on, Dr. Shutt came to the third division of his subject, namely, "The Improvement of the Practice of Agriculture in Canada through Education, Demonstration and Research." Here he reviewed at some length the development and progress that were being made, largely under Government encouragement, in educational, demonstrational and investiga-

tional work. He laid especial stress upon the benefits derived from teaching by correspondence, that is the supplying through the mails in response to individual requests, of information to farmers. The problems, he remarked, on no two farms are identical and the farmer has been encouraged to send forward his enquiries and statements of his difficulties, relating to the management of his land and the crops to which it is best adapted, the application of manures and fertilizers, the method of rotation, the breeding, care and feeding of live stock, the relative nutritive values of cattle feeds and fodders, the preparation and application of insecticides and fungicides. In this useful work of education through correspondence, the Dominion Experimental Farms were justly entitled to be considered the pioneers. Thousands of requests for advice were responded to every year. Much valuable educational work was also done through the publication and circulation of bulletins, circulars, reports and pamphlets, written and prepared by an army of experts engaged by the federal and provincial governments. An active campaign was also carried on by demonstrations and lectures in which use was liberally made of modern devices, such as lantern slides, moving pictures, illuminating maps, charts and so on. Stations to carry on this grandly progressive work had been established in many sections of the country. District Representatives and County Agents had also been appointed to take the task in hand. On the whole the provisions in Canada for carrying on educational work of this description were ample and excellent.

THOROUGHNESS IN RESEARCH

Approaching the end of his address, Dr. Shutt directed attention to the necessity

of thoroughness in agricultural research. To be successful, the planning must be careful and skillful, nothing being of a haphazard description. It may proceed by experimental methods, but not by a series of disconnected unrelated experiments. It calls for systematic and close reasoning, scrutinizing observation, more especially in field work, and an ordered marshalling of the facts before their final interpretation. The speaker thought that in this connection there was room for greater advancement. Specially trained men were required, along with adequately equipped institutions. He did not think that the universities were as yet taking that leading and special part in the improvement of agriculture that they should. Little cognizance, as far as he knew, was taken of agricultural research. He would like to see some provision made for agricultural science in the curricula of our chief schools of learning. Being himself particularly interested in chemistry, he thought greater care should be taken, and that there should be more thoroughness displayed at the universities, in the teaching of analytical chemistry. At present the greater number of honour graduates in that branch of science were poor analysts. This should be remedied, as there was no study in which exactness to the minutest detail was of more importance.

In conclusion the lecturer enlarged upon the equipment that is necessary for carrying on the great work of agricultural improvement in all its lines and suggested that the universities should establish fellowships and a post-graduate course in agricultural science. He had also in mind the establishment of a Canadian Institute of Agricultural Research, wherein the more abstract and difficult problems of agriculture could be patiently and uninterruptedly studied.

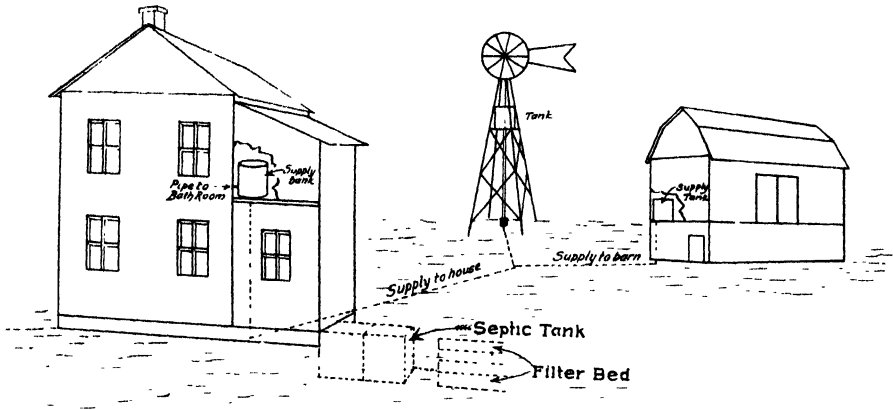
The true conception of individual progress is that of community progress; all growing up together; each helping the other; each rejoicing in the advancement of the other. In true co-operation individual ability is not restricted, is not necessarily handicapped, does not lose its reward, but has greater opportunity for development, greater merit, greater reward.—*W. E. Medd, Huron County.*

WATER SUPPLIES AND SEWAGE DISPOSAL FOR SUBURBAN AND FARM PREMISES

BY PETER H. BRYCE, M.D., CHIEF MEDICAL OFFICER, DEPARTMENT OF THE INTERIOR

EVERY town landlord has learnt that it pays him to install city water and plumbing in his houses, since they rent better, and to-day every farmer who is progressive wants similar conveniences. The writer, who has for many years supervised Public Health Work in Canada, has found it possible to install the following simple water works and sewage disposal plant in summer resorts, colleges, all year round houses in suburban districts, cheese factories and abattoirs at a very moderate cost with the complete absence of nuisance.

over the cattle stable. The piping is of $1\frac{1}{2}$ inch galvanized iron from the main tank to each house tank, while the stable tank with a 1 inch pipe supplies the drinking basins in front of the animals. In northern climates all exposed pipes are protected in boxes 1 foot square made of tongue-and-grooved sheeting with space filled with dry sawdust, while pipes laid in the ground are laid beneath the frost line. Inasmuch as the tank in the windmill is receiving constantly the underground water from the pumps at a temperature of 50° F., it is in



SKETCH SHOWING WATER SUPPLY AND SEWAGE DISPOSAL

THE WATER SUPPLY

In most cases well water will be the natural supply, pumped by windmill; but whether it be a spring higher on the hill-side piped in by gravity, or a pure lake water pumped by gasoline engine or electric pump the problem is equally simple. The immediate needs of farm houses, cattle barns, and stables can be met usually by a thousand gallon tank; but double or treble this amount is desirable to provide storage against days without wind or an engine out of repair. The location of the water tank will be that most convenient to the buildings to be supplied. Sometimes placing it over the kitchen or in the barn may prove most convenient; but usually the main tank may most economically be placed in the angle-iron frame work of the windmill.

In a plant in use for years the windmill fifty feet high, is placed over the well, which is seventy feet from the house and has a large 1,000 gallon tank in the windmill at such elevation as will supply a similar tank over the kitchen in the house and a tank

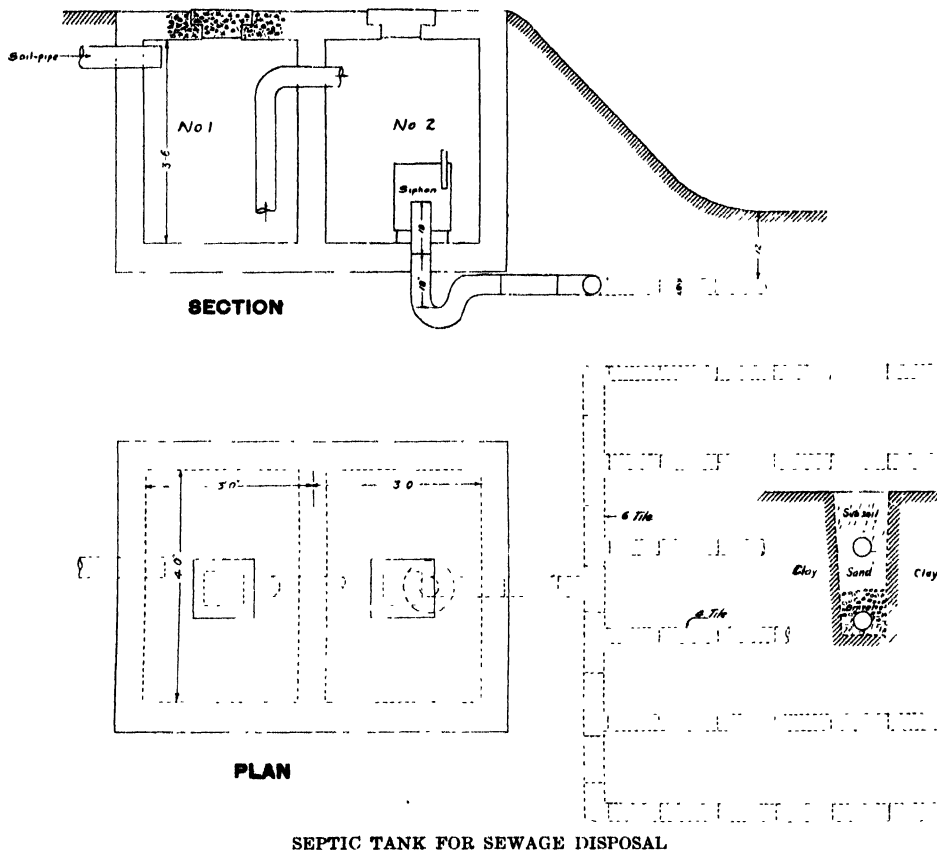
practice at times found unnecessary to make such air space around it; but if thought preferable this is readily accomplished. Overflow pipes from the house and stable tanks should be provided. The house tank supplies water to the bath, closets and kitchen sink through a $\frac{3}{4}$ inch pipe. As a men's large washroom at the house is always necessary, earthenware basins with a common discharge pipe as well as a W.C. can readily be supplied from the common tank over the kitchen, and the wash water be carried to the soil pipe and septic tank.

THE SEWAGE SEPTIC DISPOSAL

The septic tank as shown in the diagram serves for any ordinary installation and is built conveniently for a private house 6 feet long by 3 feet wide and $3\frac{1}{2}$ feet deep, on inside measurement. The walls and floor are made of concrete 8 inches thick and finished inside with a mortar of 1 part of cement to 2 parts of sand. The cover is best made double of 2 inch concrete in

each with an air space of 4 inches between to maintain the heat with 16 inch square manholes; that of the discharge tank being placed over the siphon. The operation of the tank is simplicity itself. All sewage, bath water and kitchen wastes are collected and discharged into the septic tank (No. 1). When the septic tank has been inoculated with a shovelful of garden mould, it will be found after a few days to be fermenting and a black scum forming on the surface, this being held up by the gases of

is allowable in sandy soil, but, should the soil be clayey, then it will be well to increase the size of the tank and the number of tiles and provide for but one discharge daily. It is evident that the capacity of the tiles must equal that of the contents of the tank No. 2. When soils are close and impermeable it will be necessary to provide for the absorption of the sub-surface tile water by subsoil drainage two feet below their level. For an ordinary house a trench 3 feet deep, with a tile laid at the bottom



fermentation. Liquefaction is taking place in No. 1 tank to the point of liquifying 40 per cent of the sewage in twenty-four hours. As tank No. 2 fills a point is reached at which the syphon discharges at a definite height according to the diameter of the discharge pipe and depth of trap. In the illustration the discharge is a 3-inch heavy iron pipe and empties at 28 inches. Thus the requirements of any work may always be provided by building a large enough tank for intermittent discharge, varying to some degree in keeping with the nature of the soil. Thrice in twenty-four hours

and covered with broken stone or gravel, and fine gravel at the level at which the sub-surface tiles are laid, will be found sufficient. In the case of cheese factories, creameries, and slaughter houses, it is very essential that ample area both in the tank and discharge tiles be provided, since large amounts of cold water are often used and lower the temperature of the septic tank. In cheese factories and creameries it is further worth while to have the waste water flow through a coarse canvas frame, which will serve the double purpose of saving fats which would lessen the septic action,

which readily break protein matter, starches and sugars, but acts very slowly on fats.

The operation of the system is simple and automatic. As the sewage passes into tank No. 1, which is tightly covered, it displaces from above the sewage an amount of air equal to the cubic area of the entering sewage. Hence, it is necessary to leave an outlet for this air, which is most easily supplied through the drain and soil pipe, which opens above the roof of the house, which must have no trap on it, all fixtures, as baths, sinks, basins, being each trapped separately. It is in practice found that the amount of air dissolved in the large amount of water used supplied ample oxygen for the growth of *aerobes* or air germs on the surface of the sewage, while the *anaerobes* or those which liquify the material beneath the surface utilize the oxygen of the protein substances for their growth. So soon as No. 1 tank is filled, the liquid rising in the overflow pipe discharges into No. 2 tank. Thereafter the increase of sewage in this tank equals the amount of liquid sewage entering No. 1. At each discharge into No. 2 the air over there is displaced and should communicate with that in No. 1 above the partition wall whose air passes by the soil pipe to outer air above the house. No local ventilation to the tank is thus required, and no escape of gases near the ground need take place. It is obvious that the decomposition which goes on in the tank depends upon the growth of microbes, especially of the nitrifying germs, which live normally in the soil; hence a temperature must be maintained above 50° F. This is done by banking a terrace of earth around the tank, where the slope of the ground does not allow its being set in the ground, while in winter a foot or two of straw helps to maintain the heat.

No. 2 tank must be emptied intermittently and this is most conveniently done by a proper siphon. This is a simple yet most delicate apparatus that depends for its perfect operation upon a perfect balance between inside and outside air pressure. A 3 inch siphon is ample for any ordinary

house tank and does not cost high. It is essential to know that the success of the whole system depends upon the regular automatic discharge from this tank, holding we may suppose 200 gallons which require 400 4-inch field tiles to receive this amount.

The tiles must be laid one foot beneath the surface of the ground previously graded and levelled, and are best placed on 4-inch strips of board, so that a true grade is insured which should not be more than 1 inch in every 50 feet. In this way each tile is filled equally and the liquids escape through the joints, leaving any sediment to settle in the tiles through the soil or from a tile leading to the surface at the end of a row and so nitrification of any organized deposits can go on. This is so complete that in a well-acting system nothing but a stain of dark carbon will be found in these tiles even after years. The water flowing from the deeper sub-soil tiles is clear and wholly free from odour in any system not over-taxed. The danger from winter freezing does not exist in any good porous soil. The sewage leaves the tank above 50° F. and after its discharge will have soaked into the earth below the frost line before it has time to freeze; but tiles in exposed places may very well be protected by a layer of straw, thrown over them. Where the soil area is limited and a special filter bed has to be made, it is possible to do intensive work by increasing the deep subsoil tiles. In a suburban college building plant constructed under the direction of the writer by laying rows of tiles at two feet intervals in upper and lower tile beds, the total sewage from closets, kitchens, baths and sprays for 200 inmates has been perfectly disposed of during four Ottawa winters in an area less than half an acre or at the rate of about 20,000 gallons per acre, per diem. Hence it is apparent that the waste from the floors of slaughter houses, creameries and cheese factories can be satisfactorily dealt with by the installation of such a scientific method of promoting the rapid breaking up of organic materials by imitating the process which breaks up manure in well-cultivated soils.

Minnesota now has 177 public High Schools which contain Agriculture Departments. Of these Departments fifty per cent of the teachers' time is spent in teaching Agriculture in associated rural schools.

Kansas has 188 Departments of Agriculture in High Schools which receive State aid.

AGRICULTURAL COLLEGE GRADUATES

The following gives the names and positions of the 1916 graduates from the Canadian Agricultural Colleges and the number of students completing the first and second year courses in household science and agriculture in the three Alberta Schools of Agriculture:—

NOVA SCOTIA AGRICULTURAL COLLEGE

- Bishop, John, farming at home.
 Byers, Wm. N., horticultural extension work, Nova Scotia Department of Agriculture.
 Chapman, Lyman, farming at home.
 Cass, Wm. J., plans uncertain.
 Cox, George, has applied for an officer's commission—in the meantime farming at home.
 DeLong, Walter, farming at home.
 Dewar, Robert K., enlisted.
 Dobie, Eric, Poultry Superintendent Dominion Experimental Farm, Nappan, N.S.
 Flemming, Wm., farming at home.
 Hartling, Burns A., plans uncertain.
 Jones, George D., farming at home.
 McCulloch, W. K.,
 Working in Horticultural Department at College.
 MacDonald, A. B., county representative work in Nova Scotia.
 McCormick, J. R.
 Poirier, Cyrus, assistant in charge Egg Circle work in Prince Edward Island.
 Rand, John L., farming at home.
 Redding, Karl, In charge Dairy at Agricultural College.
 Robinson, Byron V., plans to go to Cornell University.
 Schurman, Howard, farming at home.
 Kinsman, Fred, Horticultural Extension work, Nova Scotia Department of Agriculture.
 Turner, Irvine, farming at home.

MACDONALD COLLEGE SCHOOL OF AGRICULTURE

- Biggar, Thomas Howard, home farm Huntingdon, Que.
 Boving, George Bror, enlisted, No. 6 McGill Overseas Siege Artillery.
 Cochrane, Edward Stanley, home farm, Clarenceville, Que.
 Crothers, Loring William, Poultry Division, Live Stock Branch, Dominion Department of Agriculture.
 Fraser, John Gordon Carl, enlisted, No. 6 McGill Overseas Siege Artillery.
 Gooderham, Charles Benjamin, Entomology Department, Nova Scotia Agricultural College, Truro, N.S.
 Hacker, James MacMillan, enlisted, No. 6 McGill Overseas Siege Artillery.
 Hay, George Clunie, Provincial Agricultural Demonstrator, Telkwa, B.C.
 Hicks, Ora Campbell, Managing a farm in the Maritime Provinces.
 Hutchings, Clarence Basden, Entomology Division, Dominion Department of Agriculture.
 Hyndman, Austin Elliott, Horticulture Dominion Experimental Farm.
 Lyster, Chester, Wm. Davies & Company, Limited, Pte. St. Charles, Montreal, Que.
 McQuat, James Harold, home farm, Lachute, Que.
 Moynan, John Chambers, Seed Branch, Dominion Department of Agriculture.
 Schafheitlin, Rudolf, home farm, Canning, N.S.
 Ste. Marie, Joseph Antonio, Live Stock Branch, Dominion Department of Agriculture.
 Sutton, Walter Elbert, home farm, Barnston, Que.

ONTARIO AGRICULTURAL COLLEGE

- Abraham, R. H., farming, Chatham, Ont.
 Amos, L., enlisted.
 Archibald, J. G., Chemical Department, Agricultural College, Truro, N.S.
 Atkins, E. W., Apiary Division, Dominion Experimental Farms.
 Baird, A. B., Entomological Branch, Dominion Department of Agriculture, Fredericton, N.B.
 Bennett, W., enlisted.
 Binkley, H. V., Hamilton, Ont.
 *Brownridge, J. W., farming, R.R. 2 Georgetown.
 Bryden, R. J., farming, London, Ont.
 Burrows, A. R., enlisted.
 Carncross, E. E., enlisted.

Chisholm, W. M., home address, Loch Lomond, N.S.
 Clark, G. A., enlisted.
 Coke, J., farming, Erin, Ont.
 Cotsworth, F. B., enlisted.
 Coughlan, M. H., District Representative, Department of Agriculture, Charlottetown, P.E.I.
 Culp, E., fruit farming, Vineland Station, Ont.
 Dougherty, J. L., District Representative, Department of Agriculture, Chatham, Ont.
 Duncan, C. C., enlisted.
 Ferguson, C. D., Chemical Department, O.A.C., Guelph, Ont.
 Foulds, F. E., home address, 58 Fuller Avenue, Toronto, Ont.
 French, H. S., enlisted.
 Glavin, J. G., farming, Worcester, Mass., U.S.A.
 *Griffin, R. J., farming, R.R. 1, Sarnia, Ont.
 *Hill, W. H., home address, 9 Langham Street, London West, England.
 Hogan, E., District Representative, Department of Agriculture, Victoria, B.C.
 Jackson, G., enlisted.
 Johnston, J. T., enlisted.
 Lackner, C. E., Creamery, Chesley, Ont.
 Langley, B., home address, 73 McTague Street, Guelph, Ont.
 Macdonald, W. P., District Representative, Department of Agriculture, Petrolia, Ont.
 Martin, N. R., enlisted.

McCulloch, J. H., District Representative Department of Agriculture, Victoria B.C.
 McDermott, A. M., Director of Elementary Agriculture, Sussex, N.B.
 MacIntosh, J. M., Field Husbandry Department, O.A.C., Guelph, Ont.
 McLarty, J. E., Director of Elementary Agriculture, Department of Agriculture, Charlottetown, P.E.I.
 McLennan, D. M., enlisted.
 Reilly, E. E., enlisted.
 Romyn, A. E., enlisted.
 Schuyler, D. R., dairy farming, Vancouver, B.C.
 Scott, W. H., Physics Department, O.A.C., Guelph, Ont.
 Scott, H. M., enlisted.
 Shaw, W. R., District Representative, Department of Agriculture, Charlottetown, P.E.I.
 Small, E. L., home address, Wallacetown, Ont.
 Skelton, R. J., Dairy Department, O.A.C.
 Stothers, S. B., farming, Mafeking, Ont.
 Strong, W., munitions worker, Hamilton, Ont.
 Varey, J. M., enlisted.
 Walsh, F. W., enlisted.
 Welton, K., enlisted.
 Wilson, J. R., enlisted.

*Indicates students who are required to write a Supplemental Examination in French.

MANITOBA AGRICULTURAL COLLEGE

Bell, James Reynolds, Clearwater, Man.
 Bruce, Robert G., Lashburn, Sask.
 Hitchcock, Frank C., Brandon, Man.
 Hudson, John H., Winnipeg, Man.
 Judson, Arthur Roy, Taber, Alta.
 Leslie, William R., Ottawa, Ont.
 Linnell, Frank W., Summerberry, Sask.

Myers, Earl C., Grand Coulee, Sask.
 Newcombe, Frederick H., Winnipeg, Man.
 Parkinson, Fred F., Winnipeg, Man.
 Roberts, William R., Carman, Man.
 Salkeld, Rae M., Gerald, Man.
 *Winkler, Howard W., Winnipeg, Man.

Enlisted in 11th Field Ambulance Corps.

COLLEGE OF AGRICULTURE, UNIVERSITY OF SASKATCHEWAN

H. Saville, B.S.A., Demonstrator in Field Husbandry in charge of cultural work in the University of Saskatchewan.

E. C. Sackville, B.S.A., in charge of demonstration farm work in Saskatchewan, Dominion Experimental System.

SCHOOLS OF AGRICULTURE, ALBERTA

		Boys	Girls
Claresholm:	First year:	36	16
	Second year:	15	6
Vermilion:	First year:	24	7
	Second year:	16	2

Olds:	First year:	54	34
	Second year:	22	6

NOTE: Household science diplomas are granted to the successful second year girl students and diplomas to the boys who successfully complete the second year in agriculture.

SOCIETIES AND ASSOCIATIONS

BREED SOCIETY GRANTS TO FAIRS

AMOUNT AND CHARACTER OF THE AWARDS AND THEIR SPECIAL OBJECTS
FOR THE YEAR 1916

The various breed societies and associations of Canada are doing more and more each year towards the aid and encouragement of their different types of animals. Since the records were nationalized eleven years ago one of the favorite methods of carrying on this work has been to add to the prizes, either in value or in kind, at the principal exhibitions. The pioneer in this respect was the Shorthorn association, and the good example set by that organization has been followed to such an extent that to-day there are few of the associations and societies that do not give either cash, medals or diplomas. Some, such as the Belgian Draft Horse Breeders' Association, the French Coach Horse Breeders' Association, the North American Galloway Association, the French Canadian Cattle Breeders' Association, and the French Canadian Horse Breeders' Association, either do not feel warranted in using any of their funds in this way or prefer other methods of encouraging their particular type of animal. Others again give only diplomas or medals, but several add liberally to the awards made by the fair associations. Following is given in detail the different grants made this year, and the purposes for which they are intended, by all the breed societies that responded to a request for such information:

GRANTS TO EXHIBITIONS, 1916

DOMINION SHORTHORN BREEDERS'
ASSOCIATION

H. M. Pettit, Secretary-Treasurer,
Freeman, Ont.

The Dominion Shorthorn Breeders' Association have made the following grants to Fairs of 1916. These grants are used to supplement both the beef and milking Shorthorn sections at the different exhibitions, but no stipulation is made in this respect, the Fair managements being left to apportion the money in the way that will be in the best interests of the breed at each exhibition:

Ontario:—	
Canadian National Exhibition, Toronto....	\$1,000
Western Fair, London	250
Central Canada Exhibition, Ottawa	200
Ontario Winter Fair, Guelph	400
Ottawa Winter Fair, Ottawa	200
Manitoba:—	
Inter-Provincial Fair, Brandon.....	300
Winter Fair, Brandon.....	100
Saskatchewan:—	
Provincial Exhibition, Regina.....	200
Inter-Provincial Exhibition, Saskatoon	200
Prince Albert Exhibition, Prince Albert.....	100
Winter Fair, Regina.....	100

Alberta:—	
Provincial Exhibition, Edmonton.....	280
Industrial Exhibition, Calgary	200
Red Deer Exhibition, Red Deer	100
Winter Fair, Calgary.....	100
Spring Show, Edmonton	100
British Columbia:—	
Vancouver Exhibition.....	100
Quebec:—	
Great Eastern Exhibition, Sherbrooke	200
New Brunswick:—	
Provincial Exhibition, St. John	100
Nova Scotia:—	
Provincial Exhibition, Halifax	100
Maritime Winter Fair, Amherst	100
Prince Edward Island:—	
Provincial Exhibition, Charlottetown	50
Total	\$4,400

CANADIAN HEREFORD BREEDERS'
ASSOCIATION

H. D. Smith, Secretary-Treasurer,
Ingleside Farm, Hamilton, Ont.

Ontario:—	
Toronto (National) ..	\$330
London	250
Ottawa (Central)	75
Quebec:—	
Sherbrooke	25
Quebec (Provincial Exhibition)	25
Manitoba:—	
Brandon	125
Saskatchewan:—	
Regina	125
Saskatoon	100
Alberta:—	
Edmonton	125
Calgary	125
Maritime Provinces:—	
Halifax	20
Winter and Spring Shows:—	
Ontario Winter Fair, Guelph	185
Ottawa Winter Fair	50
Brandon Winter Fair	50
Regina Winter Fair:	
Fat Steers sired by registered Hereford	
Bull —	
Yearling Steers	25
Steer Calves	25
These prizes are to be added to the regular Grade Classes if won by a Grade Hereford.	
Calgary Fat Stock Show	25

Edmonton Spring Show has been granted \$25 towards Canadian Recorded Hereford classes, and a further grant of \$25 if their championship prize is won by an animal sired by a Canadian recorded Hereford bull, making a total grant of \$1,735.

HOLSTEIN-FRIESIAN ASSOCIATION

W. A. Clemons, Secretary-Treasurer,
St. George, Ont.

Ontario:—	
Toronto	\$1,000
London	150
Ottawa	150

Quebec:—	
Sherbrooke.....	150
Ormatown.....	100
Quebec.....	50

Maritime Provinces:—	
St. John, N.B.....	75
Halifax, N.S.....	75
Charlottetown, P.E.I.....	75

Manitoba:—	
Brandon.....	125

Saskatchewan:—	
Saskatoon.....	125
Regina.....	125

Alberta:—	
Calgary.....	125
Edmonton.....	125
Red Deer.....	125

British Columbia:—	
Vancouver.....	125
Victoria.....	125
New Westminster.....	125

Dairy Tests and Winter Fair:—

Guelph Winter Fair, \$375 to dairy test prize list, with specials amounting to \$125, in case Holsteins stand first in each section, and \$100 to bull calf classes, making a possible total of \$600.

Ottawa Winter Fair, \$375 to dairy test prize list, with specials amounting to \$125 as above, making a possible total of \$500.

Maritime Winter Fair, \$225 to dairy test prize list, with specials amounting to \$125 as above, making a possible total of \$350.

Any County or larger Fair, \$25 in case a Holstein wins first place in competition open to all breeds in a two-day dairy test.

These figures total \$4,400.00, with a possibility of several hundred dollars more in connection with the last item.

CANADIAN AYRSHIRE BREEDERS' ASSOCIATION

W. F. Stephen, Secretary-Treasurer,
Huntingdon, Que.

Ontario:—	
Toronto (National).....	\$200
Ottawa.....	150
London.....	75

Quebec:—	
Ormatown.....	100
Sherbrooke.....	150
Quebec.....	50
Three Rivers.....	50
Valleyfield.....	50

Maritime Provinces:—	
Halifax.....	75
St. John.....	75
Charlottetown.....	75

Manitoba:—	
Brandon.....	50

Saskatchewan:—	
Regina.....	50
Saskatoon.....	50
Prince Albert.....	25
North Battleford.....	25

Alberta:—	
Calgary.....	75
Edmonton.....	75
Red Deer.....	75

British Columbia:—	
New Westminster.....	50
Vancouver.....	50
Victoria.....	50

Dairy Tests and Winter Shows:—

Amherst Winter Fair.....	200
Guelph Winter Fair.....	200
Ottawa Winter Fair.....	200
Brandon, Dairy Test.....	25
Calgary, Dairy Test (Summer).....	25
Calgary, Dairy Test (Winter).....	25
Guelph Winter Fair, breeding classes of senior and junior bull calves.....	100
Amherst Winter Fair, breeding classes of senior and junior bull calves.....	100
Ottawa Winter Fair, breeding classes of senior and junior bull calves.....	100

At nearly all Fairs the money will be divided equally between "Four animals, the get of one sire" and "two animals, the progeny of one cow", (all to be bred and owned by exhibitor) in two and three prizes in each of the above classes.

The grant to the Canadian National Exhibition will be as follows: Herd of one bull and four females under two years, females to be bred and owned by exhibitor \$30, \$25, \$20, \$15, and \$10., and two-year-old heifer, dry \$20, \$15, \$10, \$5.

The balance of \$50 to be apportioned by the Association's representative.

Also at the Guelph, Amherst and Ottawa dairy tests, there are champions prizes offered as follows: \$50 for an Ayrshire cow, \$50 for a three-year-old heifer, and \$50 for a two-year-old heifer, providing that the highest score at these Fairs be made by a registered Ayrshire in the dairy test. All Ayrshires competing for these prizes and our specials at exhibitions must be recorded in the Canadian Ayrshire Herd Book.

The Association also offers a silver cup each, in the mature, four-year-old, three-year-old, and two-year-old classes, in the Record of Performance test, to the cow or heifer that makes the highest score in the respective classes during 1916.

The following are the regulations and basis on which these cups are awarded:

"One point for each pound of milk over and above the amount required to qualify, twenty-five points for each point of fat over and above the amount required to qualify, and ten points for each day between the freshening period after test and the fifteen month time limit. Cows and heifers must carry their calf for the normal time of at least 270 days after date of service and finish their test in the calendar year in which the cups are offered. Test to terminate on the evening of the day previous to date of freshening after test and the annual report and declaration must be received in the Chief Inspector's office within thirty days after the freshening following test, except in the case of a cow or heifer freshening after December 15th in any year, the annual report and declaration must be received in the Chief Inspector's office by the 15th of the month of January following."

Total amount of appropriations, \$2,600.

CANADIAN JERSEY CATTLE CLUB

B. A. Bull, Secretary-Treasurer, Brampton,
Ont.

<i>Ontario:—</i>	
Toronto	\$50
Ottawa	25
London	25
<i>Maritime Provinces:—</i>	
Halifax	25
<i>Alberta:—</i>	
Edmonton	25
<i>British Columbia:—</i>	
Vancouver	25
<i>Winter Fair:—</i>	
Guelph	75

CANADIAN BROWN SWISS ASSOCIATION

Ralph H. Libby, Secretary-Treasurer,
Stanstead, Que.

Valleyfield, Que.	\$10
Sherbrook, Que.	10
Quebec, Que.	10
Ottawa, Ont.	10
To be divided	\$5, 3, 2.

At Valleyfield, the prizes are given for the best pair of Swiss cattle under two years, bull and heifer; at Quebec, for the best pair of heifers under two years; at Sherbrooke, for the best heifer calf under 6 months; at Ottawa, for the best pair of calves, bull and heifer.

DOMINION SHEEP BREEDERS' ASSOCIATION

R. W. Wade, Secretary, Parliament
Buildings, Toronto.

Ontario Winter Fair	\$200
Ottawa Winter Fair, 1917	100

This association also donates to the Ontario Winter Fair, Guelph, two sterling silver cups, valued at \$150 each, for the best pen of three pure-bred lambs of a long-wooled breed and short-wooled breed, respectively, registered in the Canadian National Live Stock Records, bred and owned in Canada by exhibitor. The cups must each be won three times by the same exhibitor before becoming his property.

NOTE: The Canadian Sheep Breeders' Association (R. W. Wade, secretary) distributes its funds to the various provinces and they in turn make donations to the respective provincial shows.

ONTARIO SWINE BREEDERS' ASSOCIATION

R. W. Wade, Secretary, Parliament,
Buildings, Toronto

Canadian National Exhibition, Toronto . . .	\$150
Central Canada Exhibition, Ottawa	75
Western Fair, London, Ont., 1917	75
Ontario Winter Fair, Guelph	75
Ottawa Winter Fair	75

ONTARIO LARGE YORKSHIRE SWINE
BREEDERS' SOCIETY

R. W. Wade, Secretary, Parliament
Buildings, Toronto

Canadian National Exhibition, Toronto . . .	100
Central Canada Exhibition, Ottawa	75
Western Fair, London, 1917	50
Ontario Winter Fair, Guelph	100
Ottawa Winter Fair, 1917	75

ONTARIO BERKSHIRE SWINE BREEDERS'
SOCIETY

R. W. Wade, Secretary, Parliament
Buildings, Toronto

Canadian National Exhibition, Toronto . . .	75
Central Canada Exhibition, Ottawa	40
Ontario Winter Fair, Guelph	75
Ottawa Winter Fair, 1917	40
Western Fall Fair, London, 1917	40

NOTE: The Canadian Swine Breeders' Association (R. W. Wade, Secretary) distributes its funds to the various provinces and they make donations to the respective provincial shows.

CLYDESDALE HORSE ASSOCIATION OF
CANADA

J. W. Wheaton, Secretary-Treasurer,
Toronto

<i>Ontario:—</i>	
Toronto (National)	\$250
Ottawa	250
London	100
<i>Quebec:—</i>	
Sherbrooke	\$250
Quebec	50
Ormatown	50
<i>Maritime Provinces:—</i>	
Charlottetown	\$100
Amherst	150
Halifax	100
St. John or Fredericton	100
<i>Manitoba:—</i>	
Brandon and other places	\$600
<i>Saskatchewan:—</i>	
Regina	\$250
Saskatoon	200
<i>Alberta:—</i>	
Calgary	\$250
Edmonton	250
<i>British Columbia:—</i>	
Vancouver	\$100
New Westminster	100

The distribution of these grants is to be made as follows:—

	\$250	
Best Imported Clydesdale Stallion . . .	\$25	\$15
Best Imported Clydesdale Female . . .	20	15
Best Canadian Bred Clydesdale Stallion . .	25	15
Best Canadian bred Clydesdale Mare . . .	20	15
Best Single Mare or Gelding in harness sired by registered Clydesdale Stallion . .	25	15
Best pair Mares or Geldings in harness sired by registered Clydesdale Stallion . .	30	20 \$10
	\$200	
Best Imported Clydesdale Stallion	\$30	
Best Imported Clydesdale Female	30	
Best Canadian Bred Clydesdale Stallion . .	30	
Best Canadian Bred Clydesdale Female . .	30	
Best Single Mare or Gelding in harness sired by registered Clydesdale Stallion . .	20	\$10
Best pair Mares or Geldings in harness sired by registered Clydesdale Stallion . .	30	20

\$150

Best Imported Clydesdale Stallion.....	\$30
Best Imported Clydesdale Female.....	20
Best Canadian bred Clydesdale Stallion	20
Best Canadian bred Clydesdale Female	20
Best single Mare or Gelding in harness sired by registered Clydesdale Stallion	15 \$10
Best pair Mares or Geldings in harness sired by registered Clydesdale Stallion	20 15

\$100

Best Imported Clydesdale Stallion.....	\$20* \$10
Best Imported Clydesdale Female.....	20
Best Canadian bred Stallion.....	Gold Medal
Best Canadian bred Female.....	Gold Medal
Best single Mare or Gelding in harness sired by registered Clydesdale Stallion	20
Best pair Mares or Geldings in harness sired by registered Clydesdale Stallion	20 10

\$50

Best Clydesdale Stallion.....	\$12 50
Best Clydesdale Female.....	12 50
Best single Mare or Gelding in harness sired by registered Clydesdale Stallion	12 50
Best pair Mares or Geldings in harness sired by registered Clydesdale Stallion	12 50

Winter Fairs:—

Ottawa.....	\$1,000
Guelph.....	1,500
Regina Winter Fair.....	300
Saskatoon Winter Fair.....	150

Alberta:—

Edmonton Spring Show.....	\$200
Calgary Spring Show.....	200

Maritime Horse Shows:—

Amherst.....	\$150
Charlottetown.....	50

In addition to the foregoing prizes two gold-filled medals will be given to the Nova Scotia Provincial Fair at Halifax, to North Battleford, Saskatoon, Elk Valley, B.C., Waseca, Sask., Vegreville, Alta., Kamloops, B.C., and Prince Albert, Sask., one for the best Clydesdale stallion and the other for the best Clydesdale female.

CANADIAN SHIRE HORSE ASSOCIATION

G. de W. Green, Secretary-Treasurer,
58 Grenville, Street, Toronto

Canadian National Exhibition, Toronto.... \$35

For best two mares or fillies owned by exhibitor and registered in Canadian Shire Stud Book, divided \$20, \$10 and \$5.

At London, Saskatoon, Edmonton, Victoria, Calgary and Brandon, \$10, \$7 and \$3 are given for the best two mares or fillies, registered and owned by exhibitor.

CANADIAN PERCHERON HORSE BREEDERS' ASSOCIATION

Wm. H. Willson, Secretary, Calgary, Alta.

Calgary Spring Show.....	\$350
Calgary Summer Fair.....	350
Edmonton Summer Fair.....	350
Brandon Summer Fair.....	350

The grants take the form of trophies priced at \$35, \$20 and \$15, and are given of the same relative value in each instance for:

- Champion Stallion, Percheron, open class.
- Champion Percheron Mare, open class.
- Best Canadian bred Stallion, any age.
- Best Canadian bred Mare, any age.
- Best Percheron Mare, with foal at side.

CANADIAN HACKNEY HORSE SOCIETY

H. M. Robinson, Sec. Treas., 883 Broadview Ave., Toronto.

This society adds 20 per cent to the prize moneys given by the Canadian National Exhibition, the Guelph Winter Fair and the Ottawa Winter Fair, and donates to each four gold medals, one each for best stallion and best mare 14.2 and under; and one each for best stallion and best mare over 14.2. Four gold medals are similarly given to Edmonton Summer Fair. Two gold medals, one each for best stallion and best mare any age or height, are given to Saskatoon, Regina, Calgary and any other fair of like nature that requests the same. Silver medals are offered to smaller shows, both east and west, Sherbrooke, Miramichi, Chatham, Quebec, etc. Similar medals are donated as the secretaries of the various shows and exhibitions apply for them. Each director has also the privilege of giving a silver medal to any show when he thinks the exhibit is deserving.

CANADIAN PONY SOCIETY

G. de W. Green, Sec. Treas., 58 Grenville St., Toronto.

Silver medals are given as follows;

Edmonton Spring Show: Best Shetland pony mare, or gelding, by sire recorded in Canadian pony stud book.

Edmonton Summer Show: (1) Best Shetland pony, by sire recorded in Canadian pony stud book; (2) Best pony, any other breed, by sire registered in the Canadian pony stud book. Ponies winning a medal at the spring show not eligible to compete.

Western Fair: (1) Best pony stallion, not exceeding 14 hands, open to all breeds. (2) Best pony mare, not exceeding 14 hands, open to all breeds.

Canadian National Exhibition: (1) Best Shetland pony stallion; (2) Best Shetland pony mare; (3) Best Welsh pony stallion; (4) Best Welsh pony mare; (5) Best pony by registered sire or out of registered dam. In sections 1-4 ponies awarded medals must be recorded in the Canadian pony stud book under the names of the exhibitors and must not exceed 14 hands.

Regina: (1) Best Shetland pony, mare or gelding, by registered sire; (2) Best pony, mare or gelding, any other breed than Shetland (Hackney excepted), by registered sire.

Toronto Open Air Horse Parade: (1) Best pony in harness; (2) Best pair of ponies in harness.

Guelph Winter Fair: (1) Best pony stallion not exceeding 14 hands; (2) Best pony mare not exceeding 14 hands. Animals must be recorded in the Canadian pony stud book in the names of the exhibitors.

THE HORSE INDUSTRY

ON May 20th, a meeting of representatives of the different horse-breeding societies was held in Toronto to consider the situation as regards the horse industry. Mr. William Smith, M.P., chairman of the National Live Stock Records Board, presided. After discussion and a statement from the Live Stock Commissioner regarding the shortage of horses, it was decided to spend a thousand dollars in advertising in the newspapers directing the attention of farmers and breeders to the state of affairs and calling upon them to resume activity in breeding, to choose the best animals for service and to preserve their mares. A committee was also appointed to draft a circular for distribution with the same object in view. The campaign thus entered upon was vigorously pushed. Besides the advertising 60,000 copies of the circular given below were printed in French and in English. Every provincial government was approached in the matter and all responded favourably excepting Manitoba, from which no reply was received. The circular referred to was dated from the office of the Canadian Live Stock Records Board, was distributed as generally as possible in rural districts throughout the country, and read as follows:

Ottawa, Canada,
May 27th, 1916.

Dear Sir,—

The breeding of horses has become a matter of prime necessity. Before the war commenced there was a slump in prices owing to financial conditions and the inroads of motor power that led to a cessation of breeding. Then the war came with its demand for certain classes. Following the previous decline in the demand many farmers sacrificed their

mares. The result is a serious depletion and a sure scarcity.

The demand is increasing and will continue to increase long after peace has been declared. If Canada is to take advantage of the situation the time to start in is now. There will be an assured market demand for foals at weaning times from mares bred now.

Not only has the wastage by reason of war been enormous, but in all the belligerent countries, not omitting Great Britain, there has either been a partial stoppage or a whole stoppage of breeding by reason of the scarcity of labour, the disturbed conditions, or entire devastation.

Whether the war lasts or ceases there must continue an undiminished demand for horses. When peace comes there will be a long period of replenishment. Then quality as much and even more than quantity will be required. Hence the evident call to every Canadian farmer is to breed and to breed to the best available, to utilize his mares for production and to secure the immediate services of the best pure-bred sire of type in his neighbourhood. It will pay.

This appeal is addressed to you with the endorsement of the various horse breeders' associations of Canada, who urge decisive action by the farmers of Canada to remedy the serious situation that has arisen.

Yours truly,

CANADIAN NATIONAL LIVE STOCK
RECORD BOARD,

John W. Brant, Secretary.
William Smith, M.P., Chairman.

CATTLE BREEDERS' CLUBS

THE breeders of at least three breeds of cattle in Canada have adopted the plan of organizing local clubs for the advancement of their respective interests. These clubs are confined to the breeders of Holstein-Friesian, Ayrshire and Shorthorn cattle. The movement is of comparatively recent origin, but it is extending rapidly, more especially in the provinces of Ontario and Quebec. The clubs are conducted independently of each other and of the parent record association. Many of the clubs have been organized by the agricultural District Representatives, who are, in some cases, ex officio honorary directors.

HOLSTEIN-FRIESIAN CLUBS

Mr. W. A. Clemons, Secretary of the Holstein-Friesian Breeders' Association, reports that the Holstein-Friesian breeders' clubs are in operation at the following points: East Elgin, Oxford, Norfolk, Niagara Peninsula, Brant, Waterloo, North York, Belleville, Brockville, Napanee and Victoria, all in Ontario.

The organization of the clubs is fairly uniform. The following has reference particularly to the Waterloo club, which to a great extent represents the organization and objects of all the clubs. The Waterloo Holstein-Friesian Breeders' club was organized at Berlin on March 23rd, 1915.

The officers of the club consist of a president, first and second vice-presidents, secretary-treasurer and ten directors. The officers and directors consist of a board of directors who have entire control and management of the affairs and business of the club, with full power to do what they deem right and proper for the best interests of the club. The membership consists of all persons who are interested in the Holstein-Friesian breed and who pay the required annual fee of one dollar. The objects of the club are as follows:

OBJECTS

"To promote good fellowship among the members, and the advancement of the general interests of the Holstein-Friesian breeders and cattle by the holding of public sales at auction, by encouraging the entry of cows and heifers in the advanced registry, and the weighing and testing the milk of the whole herd, discussion of the best methods of breeding, rearing and exhibiting and raising the standard of excellence of the breed by bringing before the public the good qualities and exceptional merits of the breed, and in other ways to generally widen and extend the interests of this breed of cattle, by acting in unison upon all occasions which demand it, by establishing a reputation for Waterloo county as a centre for high-class Holstein-Friesian cattle."

An important part of the work of many of the clubs is the carrying on of public sales of Holstein-Friesian cattle. Some of the clubs hold demonstration meetings of an educational character, including in these, stock judging classes. They usually end their active year with a banquet for the members and their wives, thus developing a social atmosphere. The Holstein-Friesian Association of Canada has three provincial branches, in Quebec, Alberta and British Columbia, respectively.

AYRSHIRE CLUBS

Several years ago, Ayrshire breeders in the Menie district, Ontario, believing that co-operation was a good thing for a community, got together and organized a club. Its purpose was to further Ayrshire interests by the promotion of good fellowship, by the holding of public sales at auction, by encouraging the entry of cows and heifers in the Record of Performance test, discussing the best methods of breeding, rearing and exhibiting, thus raising the standard of excellence of the breed, to bring before the public the good qualities and exceptional merits of the breed, and in other ways to generally widen and extend the interests of this breed of cattle, and to act in unison upon all occasions which demand it. With such an object in view this club did splendid work and the breeders of Ayrshires increased in that district.

The organization of other clubs followed and splendid work for the breed has been done, particularly by the Southern Counties club in Western Ontario. More new members and an increased number of entries to the Record of Performance in 1915 came from the precincts of that club. This club has also held two very successful auction sales. Each club usually holds two or three meetings every year and one of them is in the nature of a judging demonstration at which the secretary of the Canadian Ayrshire Breeders' Association, W. F. Stephen, or some other expert, takes charge.

The Howick-Huntingdon, Hemmingford and Dundas-Grenville clubs have just been organized.

The following are the Ayrshire clubs in Canada:

MENIE DISTRICT CLUB

President: Alex. Hume, Campbellford, Ont.
Secretary: W. E. Tummon, Crookston, Ont.

SOUTHERN COUNTIES CLUB

President: W. W. Ballantyne, Stratford, Ont.
Secretary: John McKee, Norwich, Ont.

BROCKVILLE CLUB

President: W. H. McNish, Lyn, Ont.
Secretary: A. J. Hudson, Lyn, Ont.

ALBERTA CLUB

President: A. H. Trimble, Red Deer, Alta.
Secretary: Rowland Ness, De Winton, Alta.

BRITISH COLUMBIA CLUB

Secretary: Joseph Thompson, Sardis, B.C.

HOWICK-HUNTINGDON CLUB

President: James Bryson, Brysonville, Que.
Secretary: Gilbert McMillan, Huntingdon, Que.

DUNDAS-GRENVILLE CLUB

President: Wesley Hamilton, Chesterville, Ont.
Secretary: Arthur Christie, Winchester, Ont.

HEMMINGFORD CLUB

President: Stewart Cleland, Hemmingford, Que.
Secretary: Fred Sweet, Hemmingford, Que.

SHORTHORN CLUBS

Mr. H. M. Pettit, Secretary of the Dominion Shorthorn Breeders' Association, advises that one Shorthorn club has been organized. This is located in Brant county, Ontario. Its president is James Douglas, Caledonia, and the secretary is Geo. L. Telfer, Paris. This club was organized

in 1915 and has twenty members. The objects of the club are to further the interests of the Shorthorn breeders of the district by advertising the district as a Shorthorn centre, the holding of auction sales, and in other ways extending the interests of the breeders. During its first year this club has been able to dispose of all of the available cattle of its members at fair prices. The annual membership fee is one dollar per year.

There are several organizations which are doing good work for the Shorthorn breed but which cannot correctly be called Shorthorn clubs, as the members of all breed associations have the privilege of sharing in the advantages of these clubs, societies, associations or companies, as they may happen to be termed. Prominent among these is the Guelph Fat Stock club, which conducts the annual provincial bull

sale at Guelph. At this sale breeders of pure-bred stock from all over the province have an opportunity of disposing of their young bulls, which are of serviceable age and which measure up to the standard of quality set by the club. The Victoria county breeders have a similar organization and have an annual sale of their bulls and probably some females, at Lindsay. Bruce county organized this year and had their first sale at Walkerton, where a number of very good Shorthorn bulls found a market.

What is probably the largest organization is the Western Ontario Consignment Sale Company, with headquarters at London. This association holds sales twice a year or oftener, if the stock is available. The results so far have been very good and the prospects are bright for the future.

THE BROWN SWISS CATTLE BREEDERS' ASSOCIATION

The Canadian Branch of the Brown Swiss Cattle Breeders' Association held a convention at Toronto early in May. It is interesting to note that College Bravura 2nd, 2577, the cow that headed the Brown Swiss register in 1913, gave 19,460.16 lb. of milk, containing 798.16 lb. of butterfat. In 1915, Ethel B. 3842, gave 18,815.12

lb. of milk, containing 779.97 lb. of butterfat. The officers elected for the ensuing year are: President, C. Standish, Ayerscliffe, Que.; vice-president, W. A. Jolly, Waterloo, Que.; directors, R. Ballagh, Guelph, Ont., R. H. Libby, Stanstead, Que.; secretary, R. H. Libby, Stanstead, Que.

THE CANADIAN SEED GROWERS' ASSOCIATION

The annual meeting of the Canadian Seed Growers' Association was held in the Canadian Building, Ottawa, June 16th. Business matters engaged the attention of the meeting entirely. The secretary's report stated that during 1915, selections of seed were made by 228 growers, compared with 215 in 1914, 181 in 1913, and 153 in 1912. Applications for membership in 1915 numbered 132, in addition to which groups of farmers had indicated their intention to organize seed centres and wished to be recognized by the Association. All centres previously organized report satisfactory progress. The Directors' report stated that the past year had been especially noteworthy in bringing out the advantages of the policy of developing initiative action and responsibility by provincial and local bodies and individuals, which was adopted two years ago. Greater vigour was being displayed in establishing the value of registered seed.

The officers elected were as follows, ten directors being chosen by the Association and one by each of the nine provinces:

President, Dr. Jas. W. Robertson, chairman of the Royal Commission on Industrial Training and Technical Education; vice-presidents, Dr. C. A. Zavitz, Ontario Agricultural College; Prof. James Murray, Macdonald College, Quebec, and Prof. M. Cumming, Principal Nova Scotia Agricultural College, Truro; directors chosen by the Association—Prof. John Bracken, Saskatchewan; Mr. R. H. Carter, Fort Qu'Appelle, Sask.; Dr. C. A. Zavitz, O.A.C.; Mr. W. H. McGregor, Miscouche, P.E.I.; Prof. M. Cumming, Truro, N.S.; Prof. James Murray, Macdonald College; Mr. George Dow, Gilbert Plains, Man.; Mr. H. A. Craig, Deputy Minister of Agriculture, Alberta; Mr. A. Austin, Kamloops, B.C.; Mr. Wm. Palmer, Scotch Lake, N.B. Only three of the directors from the different provinces had been nominated up to June 20, namely, Mr. W. W. Thompson, Regina, Sask., Mr. C. F. Bailey, Assistant Deputy Minister of Agriculture, Ont., and Mr. F. W. Savoie, Que. The secretary is Mr. L. H. Newman, B.S.A., Ottawa.

THE EASTERN ONTARIO WINTER FAIR

At a meeting of the Eastern Ontario Winter Fair Association, Ottawa, held on June 10th, Messrs. John Bright, Live Stock Commissioner, W. J. Cowan (Cannington) and Peter White, K.C., were elected honorary presidents, and Wm. Smith, M.P., Columbus, Ont., president, J. C. Stewart, vice-president; John Bright, J.

H. Grisdale, Director of Experimental Farms, Ottawa, R. W. Wade, Director of Live Stock branch for Ontario, and Geo. Robertson, Central Experimental Farm, Ottawa, executive committee with the president and vice president, ex-officio; W. D. Jackson, B.S.A., Carp, Ont., secretary-treasurer.

THE SCHOOL GARDEN ASSOCIATION OF SASKATCHEWAN

At the annual convention of the Saskatchewan Educational Association, held at Prince Albert, the School Garden Association of Saskatchewan was organized with the following officers: President, A. Kennedy, Inspector of Schools, Weyburn; 1st

vice-president, J. A. McLeod, Inspector of Schools, Estevan; 2nd vice-president, Mrs. E. A. Hardy, Laird, Saskatchewan; secretary-treasurer, Charles J. MacKay, Principal, Souris School, Weyburn.

THE SASKATCHEWAN WINTER FAIR

At the annual meeting of the Saskatchewan Provincial Fair Board, held at Regina on June 19th, it was decided that for the future the winter fairs should be held in December instead of in March. It was also decided that henceforth instead of the fair for Southern Saskatchewan being known as the Saskatchewan Provincial Winter Fair and that for the northern section as the Saskatchewan Inter-provincial Fair, one should be known as the Saskatchewan Winter Fair at Regina and the other as the Saskatchewan Winter Fair

at Saskatoon. The Saskatchewan Poultry Breeders' Association resolved that instead of having separate shows all their shows should in the future be held under the auspices of the Winter Fair Association. Mr. Robert Sinton, of Regina, was re-elected president, Hon. W. C. Sutherland of Saskatoon, vice-president, and Mr. P. F. Bredt, acting Provincial Live Stock Commissioner, Regina, secretary. A committee of management representing the different interests was also appointed.

THE SASKATCHEWAN STOCK GROWERS' ASSOCIATION

The fourth annual convention of the Saskatchewan Stock Growers' Association was held on June 6th and 7th in Swift Current. Addresses were delivered by F. H. Auld, Acting Deputy Minister of Agriculture, and Dr. J. G. Rutherford, of the Natural Resources Branch, Canadian Pacific Railway, Calgary.

A large number of resolutions were passed, the more important of these dealing with the Prairie Fires Act; the Stray Animals Act; Lien notes on live stock; an outbreak of contagious abortion in mares, which has caused considerable loss to Saskatchewan stockmen; the federal government regulations for the cleansing and disinfecting of stock cars,

and with diversified farming. In connection with the latter the convention was strongly of the opinion that federal legislation was necessary to regulate and control the marketing conditions of live stock, including: the licensing and bonding of commission men; the establishment of stock yards; the abolition of the uniform levy made by the abattoirs on all stock whether deceased or sound, and such other provisions as may be deemed necessary to safeguard the live stock interests of the West. The officers appointed for the ensuing year are as follows:—President, Olaf Olafson, Mortlach; vice-president, W. J. Hoff, Swift Current; secretary-treasurer, J. D. Simpson, Moose Jaw.

THE PACIFIC NORTHWEST ASSOCIATION OF DAIRY AND MILK INSPECTORS

BY W. T. McDONALD, LIVE STOCK COMMISSIONER, VICTORIA, B.C.

THE third annual convention of the Pacific Northwest Association of Dairy and Milk Inspectors was held in Vancouver, May 12th and 13th, 1916.

This association was organized for the purpose of bringing together Federal, Provincial or State, and Municipal Inspectors for the purpose of creating greater uniformity in inspection work. It was considered that by bringing the Inspectors together, all would benefit by discussions of mutual interest. The suggestion was also made that in order that the discussions should be well rounded out, and that the Inspectors might be given an opportunity of viewing the various questions from all standpoints, it would be well to have producers, dealers and consumers of milk represented. Accordingly, the associate membership was extended to all interested in a better milk supply. The results have far surpassed the greatest hopes of the most sanguine of the promoters, and while attending our conven-

tions I have always felt that they were of greater value to those in attendance than was the case in any other similar conventions I have ever attended. The recent convention was the first held by this association in Canada.

We had speakers who came from as far as Washington, D.C., to address the convention, and the recent convention has been the most successful yet held. The attendance was nearly 200, while of this number 40 came from the United States. A movement was set on foot to inaugurate a *Milk Day* for the Pacific-Northwest, for the purpose of boosting the consumption of milk.

The next convention will be held in Tacoma, Wash.

The following officers were elected for the ensuing year:—

President, G. C. Henderson, Everett, Wash.; 1st vice-president, Dr. J. Anderson, Spokane, Wash.; 2nd vice-president, W. T. McDonald, Victoria, B.C.; secretary-treasurer, A. M. Henderson, Seattle, Wash.

NEW PUBLICATIONS

THE DOMINION DEPARTMENT OF AGRICULTURE

THE DOMINION EXPERIMENTAL FARMS

THE TOBACCO DIVISION

Tobacco Growing in Canada, by F. Charlan, Chief of the Tobacco Division; Bulletin No. 25, second series. The entire cultural method of tobacco is here outlined from the selection and preparation of the land to the perfected article. Interest in tobacco growing is increasing in Canada and numerous enquiries for information has led to the publication of this thirty-page Bulletin which should well fulfil the object it is sought to attain. It is a guide and handbook written in concise and plain terms.

THE DIVISION OF BOTANY

Late Blight and Rot of Potatoes, caused by the fungus *Phytophthora infestans*, de Bary, by Paul A. Murphy, B.A., M.R.C.S.L., assistant in charge of the Field Laboratory for Plant Pathology, Charlottetown, P.E.I., Circular No. 10. "The subject treated of in this circular," says the Director of Dominion Experimental Farms, "is a most important one, especially to the potato growers of Quebec and the

Maritime Provinces, and I would recommend a wide distribution in order that the efficacious preventive measures given herein may become generally known as soon as possible and heavy annual losses thereby avoided." The Dominion Botanist, writing on the same subject says: "Late Blight is recognized as one of the most destructive plant diseases in the world. In certain years it has caused incalculable losses, yet these can be reduced to a minimum by thorough and timely spraying with Bordeaux mixture. Experience and experiments have shown again and again that when this is done according to the clear simple instructions given by Mr. Murphy in this circular, this practice is a profitable one every year and a very profitable one on years when Late Blight is prevalent." Mr. Murphy in this circular of 12 pages describes very fully the symptoms and methods of control.

THE ENTOMOLOGICAL BRANCH

The Army Cutworm, by E. H. Strickland, M.Sc., Field Officer, Bulletin No. 13. Mr. Strickland, in his position of field officer in charge of the Entomological Laboratory at Lethbridge, Alta., had a good deal to do with the extensive outbreak of the Army Cutworm in Alberta last year. This outbreak covered the enormous territory of

3,000 square miles. Dr. Gordon Hewitt, Dominion Entomologist, in his introductory letter, bears testimony to the good work performed by the author of the Bulletin, in which are set out the results of the investigation then carried on, and the action that was taken towards controlling the pest. The Army Cutworm, Dr. Hewitt states, is new to Canada as a field pest. For this reason the thirty-page Bulletin, with its plentifulness and exactness of detail and appropriate illustrations, is exceptionally valuable.

THE FRUIT BRANCH

Fruit Crop Report, No. 1, recently issued by the Fruit Branch of the Dominion Department of Agriculture, deals in an optimistic manner with regard to the outlook for the 1916 fruit crop. Prospects in Great Britain are reported as excellent; while considerable damage has been done by frosts in the Northwestern States, prospects are bright although the season is backward. In Canada, basing the report upon the amount of blossom, the prospects for the 1916 apple crop are particularly favourable; the tomato acreage in Ontario is decreased, while the season in British Columbia is several weeks late; the production of sour cherries both in Ontario and British Columbia promises to be very heavy; the strawberry crop is expected to be good, while raspberry canes have been severely winter-killed in Ontario and in many sections of British Columbia. Pears, peaches and plums have shown good bloom and heavy crops are predicted, particularly of peaches.

THE LIVE STOCK BRANCH

A number of circulars of the greatest importance have recently been issued by the Live Stock Branch of the Federal Department of Agriculture. One series deals exclusively with the sheep and wool industry. In the earliest of these, attention is directed to the fact that prizes for wool will be given at the leading fairs. The classes are outlined as Domestic Fine Medium, Domestic Medium and Domestic Coarse. "Domestic" means wool produced under farming conditions or in small flocks as distinct from Range wool. The Fine Medium Class includes typical Shropshire, Hampshire, Suffolk and Southdown wool; the Medium class the Oxford Down, Dorset Horn and the finest Cheviot; the Coarse, the Lincoln, Leicester and Cotswold. Wool from cross-bred or grade sheep can be included in any of these classes. Another circular gives a list of wool associations that have been formed with the name of the secretary or manager, the grading station, and an estimate of the probable production at each station. A third is directed to buyers and names the

fairs at which prizes for wool will be given as Charlottetown, Halifax, Sherbrooke, Quebec, Three Rivers, Valleyfield, Toronto, London, Ottawa, Brandon, Regina, Calgary, Edmonton, Saskatoon and Vancouver. It is pointed out that the fleeces in most instances will be sold for delivery at the close of the respective fair.

Three bulletins have also been issued to the press in connection with the Production and Thrift campaign, one urging an increase in the breeding of the right type of horse, drafters and farm chunks in particular, another pointing out the necessity for more cattle, and the third advocating further development of the poultry industry. The second bulletin refers to the prices for cattle products ruling in Britain, the exhaustion and shortage of supply, especially of beef cattle, and the opportunity Canada has to take advantage of an assured highly remunerative market. The necessity of breeding to the best, if we are to compete with the United States and the Argentines, is impressively alluded to. It is also urged that the farmer should feed and finish his own stock. In conclusion, it is pointed out that a good herd of milking beef cows will bring a return as regular as the change of the seasons. "If labour is not available to milk all of them," the bulletin says "two calves may be put on a single cow, possibly a third, and better calves reared than if fed by hand. The feeding of these calves until fit for market, whether as baby beef, or as butcher, or as export stock, will insure a steadier income than can be obtained by the continuance of the old methods."

The third bulletin, having reference to poultry, shows that while in 1913 Canada imported 13,240,111 dozen eggs, in 1915 the imports were 3,783,952 dozen, a decrease of 9,456,159 dozen. On the other hand, while in 1913 we exported only 147,149 dozen, in 1915 we exported 7,898,322, an increase of 7,751,173 dozen. This indicates an increase of production in the two years of 17,207,332 dozen. The exports nearly all went to the United Kingdom. Notwithstanding the increased production, prices were 5c higher in March and 3c higher in April, this year, than last year. In these circumstances the hatching of as many chickens as possible is advocated, so that the production of eggs may be advanced still further.

Assistance to Wool Growers. A twenty page, neatly gotten up booklet, in convenient form for the coat pocket, has been issued for circulation among wool-growers, giving the precise terms on which assistance will be given associations in the marketing of wool clips. In order to receive this aid associations must comprise at least 10 members and 3,000 sheep. The constitution by-laws and rules for forming such associations are given, along with the

form of application for assistance, directions for caring for sheep in order to secure a good quality of wool and for preparing and packing, correlation of American, British and Canadian grades and their distinctive terms and the classification of Canadian Wools.

Production and Markets, by John Bright, Live Stock Commissioner, and H. S. Arkell, Assistant Live Stock Commissioner. It is announced that this 16-page pamphlet is published with confidence that the Canadian farmer has never been in a more secure position than at present as regards the extension of his breeding operations, and to enable him to form his own conclusions. Details are brought together, most of which have previously appeared in THE AGRICULTURAL GAZETTE, showing the foundation on which this confidence rests. Statistics of exports and movements are given, and prices quoted of all kinds of live stock. The measures that other countries are taking to meet the situation are described. In short, abundant reasons are given for increased activity in breeding and for improvement in methods of selection. Mr. H. S. Arkell contributes a special report under the heading of "Our Export Trade" of an investigation made by him, as late as January last, into the requirements of the British and French markets. He declares that the opportune moment has arrived for Canada to assume a very important place in the markets of the world. To occupy this place integrity and scientific intelligence must characterize all our business operations. Mr. Arkell emphasizes this fact and especially reviews the situation relative to hog products, frozen beef and canned goods. He also deals with organization of the trade, in production as well as in marketing and transportation.

THE DAIRY AND COLD STORAGE BRANCH

The Grimsby Precooling and Experimental Fruit Storage Warehouse, Bulletin No. 47, prepared under the direction of Dairy and Cold Storage Commissioner, J. A. Ruddick, by Mr. Edwin Smith, B.Sc., who is in charge of the Cold Storage Warehouse. This bulletin is divided into two parts. Part one deals with the objects aimed at, and gives a summary of the results already secured in the operation of the plant, while part two contains the rates to be charged for the precooling and storage of fruit and regulations under which the fruit will be handled.

Precooling, Shipment and Cold Storage of Tender Fruit, with Notes on Packing and Packages, Bulletin No. 48 of the Dairy and Cold Storage series, prepared by Edwin Smith, B.Sc., assisted by J. M. Creelman,

B.S.A. This bulletin gives in detail the results of two years' work at the Grimsby Precooling and Experimental Fruit Storage Warehouse. The scope of the work, all of which is covered in this bulletin, includes precooling investigations with regard to the storage and shipment of strawberries, red and black raspberries, cherries, plums, peaches, pears, tomatoes, gooseberries, black currants, red currants, cucumbers, sweet corn, celery and apples; investigations re the maturity of strawberries, cherries, plums, peaches and tomatoes for long distance shipments; investigations on the effect of using low temperatures for precooling strawberries, sweet cherries, sour cherries, plums, peaches and tomatoes and investigations re the rate of cooling. The bulletin concludes with a statement giving the results of a number of fruit package tests made to determine the relative carrying and selling merits of several packages for strawberries, sweet cherries and sour cherries.

THE PROVINCIAL DEPARTMENTS OF AGRICULTURE AND OF EDUCATION

PRINCE EDWARD ISLAND

The Birds of Prince Edward Island. Bulletin No. 1 of the Island Rural Science Department is devoted to the birds. It consists of an article taken from the *Teacher's Magazine* for April, 1916, giving advice on the study of our feathered friends and a list of those that make the island a resort, or are natives, or have been found there.

Annual Report of the Public Schools. "The most noteworthy feature of the year in connection with school-work was the marked advance made in the study of rural science and agriculture," says the acting Chief Superintendent of Education in his report. He details the beneficial results derived from the short courses for teachers and the progress made in school gardening. The Principal of the Prince of Wales' College testifies to the valuable assistance in the development of agricultural instruction afforded by the grants made through THE AGRICULTURAL INSTRUCTION ACT. The first two numbers are given of *The School Circular*, issued under the auspices of the Department of Education, and especially devoted to the promotion of rural science and other features of education meeting the needs of country life.

NEW BRUNSWICK

The Rural Education Monthly is the title of a new publication of six pages issued by the Elementary Agricultural Education Division of the New Brunswick

Department of Agriculture in the interests of practical education throughout the province. The first number is largely devoted to school gardens, agricultural competitions between boys and girls and school fairs.

QUEBEC.

Competition in Standing Crops. These competitions started in 1908 and this 86-page, grey-covered book is the eighth report and record connected therewith. In the first year the number of competitions opened was 18 with 171 competitors. In 1915 there were 80 competitions and 1229 competitors, being an increase of 13 competitions and 226 competitors over the previous year, the largest increase since the second year. Reports and remarks by the judges accompany the records.

ONTARIO

Home Canning of Fruits and Vegetables, by E. L. Davies, Demonstrator in Bacteriology, Ontario Agricultural College. Not only the woman on the farm, but the woman in any and every home would be benefitted by reading with understanding this Bulletin No. 236 of the Ontario Department of Agriculture. Within the 12 pages the housewife is told in plain terms what to do and what to avoid doing in every description of fruit and vegetable canning.

Halton Junior Farmer is the title of a four-page leaflet recently issued by the Junior Farmers' Association of Halton county. The leaflet is indeed meritorious and but serves to show the keen interest being awakened in the minds of the young farmers throughout the province of Ontario by the work of the District Representatives. Many items dealing with agriculture are published, each and all prepared by members of the association.

The Grape in Ontario by F. M. Clement, B.S.A., Director Horticultural Experiment Station, Vineland. This is a 48-page Bulletin, numbered 237, intended, we are told in the introduction, to serve as a help and guide to those who have not had an extended experience with vineyards and to others who may desire to study the subject a little more fully. The information, which is of a complete description, tracing the grape from prehistoric times to the present day, and treating of methods of cultivation of the different varieties, is emphasized by a large number of photographic cuts and interesting statistics regarding quantities grown, the acreage covered in the seven leading counties, and the exports and imports of our own and other countries. Insect pests that attack the vine and diseases that affect it are

described and remedies prescribed. Home-made wine also receives attention as well as packing, shipping and marketing. It is worth knowing that all the serious diseases of the grape in Ontario can be prevented from causing loss by spraying with Bordeaux Mixture, as recommended for black rot, with the addition of flowers of sulphur later in the season if powdery mildew appears.

Lime and Its Uses in Agriculture, by R. Harcourt, Professor of Chemistry, Ontario Agricultural College. During the last two or three years there has been a great deal of interest taken in the question of applying lime to farm lands. Yet correspondents appear to have no common understanding of soil acidity, its causes, its effects, tests which may be made in the field, what materials may be used to counteract it, and many points in connection with this question. So runs the first paragraph of this 12-page Bulletin No. 238, which is designed to supply the lacking knowledge. All phases of the subject are dealt with and information imparted of great importance.

MANITOBA

Couch Grass and its Eradication is the subject of a leaflet edited and prepared by Prof. S. A. Bedford, Chairman Weeds Commission, Manitoba Department of Agriculture. The weed couch grass is described, its habit of growth outlined and details given of successful methods followed in its eradication.

Barn Ventilation is the title of Extension Bulletin No. 2 of the Manitoba Farmers' Library. This bulletin is from the pen of L. J. Smith, B.Sc., Professor of Agricultural Engineering at the Manitoba Agricultural College. The opening pages are devoted to a brief review of the need for ventilation and to a discussion of out-take and in-take flues, etc. The two systems, the Rutherford system and the King system, are fully described and illustrated.

The Horticultural Department of the Manitoba Agricultural College has recently issued two large posters in the interests of the trees of the province. The Fall Canker worm, which is one of the most destructive insects to forest and shade trees, through its habit of eating the leaves, forms the subject of one of the posters. Special instructions are given with reference to spraying and banding the trees in order to successfully combat the insect. The second poster is devoted to the subject of Plant Lice, which collect on the under surface of the leaves and suck the juices of the trees, causing the leaves to curl, and the young tips to die. As the most effective means of controlling Plant Lice, spray early; spray thoroughly before the leaves curl,

and spray with the right solution, is the advice given. The sprays recommended and described are the nicotine solutions. Numerous and suitable illustrations enhance the value of these posters.

Standing Crop Competitions and Seed Fairs by T. J. Harrison, B.S.A., Professor of Field Husbandry, Manitoba Agricultural College, constitutes Bulletin No. 3 of the Manitoba Farmers' Library. This publication gives directions to agricultural societies in arranging competitions and preparing prize lists; to competitors respecting selection of seed and preparation of land; and to judges respecting methods of standardizing the different classes of grain entered for the competition.

SASKATCHEWAN

The Monthly Bank Bulletin Circular issued by the Department of Agriculture, for May, 1916, announces that, in view of the satisfactory returns last year from the co-operative poultry marketing project, this year two killing and marketing stations will be operated, one in Regina to serve the southern half of the province, and the other at Saskatoon for the territory tributary to that point.

Poultry producers are invited to fit up their birds and send them in alive to these stations this fall, where they will be killed, plucked and graded, under the supervision of experts provided by the College of Agriculture, and subsequently stored and sold by the Co-operative Organization Branch. Advance payments at graded prices, consistent with the quality of the birds, will be forwarded to producers when their birds reach the killing station, and when the poultry has been disposed of, final payments will be forwarded, returning to the producer every cent realized from the sale of the birds, less the actual cost of handling. It is anticipated that the stations will be ready to receive birds by November 15 and will remain open for a month or more.

School Fairs, School Agriculture Circular, No. 5, of the Department of Education, Saskatchewan. One of the most recent educational movements in Saskatchewan is the organization of Rural Education Associations, the membership of which consists of teachers and others interested in educational matters.

In Circular No. 5 the recommendation is made that these associations assume the leadership in the organizing and conducting of school fairs, making, as far as possible, the pupils themselves responsible for the organization of the fair. The regulations, prize list and prizes as published cover a very wide field and offer many opportunities for the ingenuity and industry of teachers and pupils alike. The prize list is

divided into 6 classes, containing subdivisions to the number of 59, covering school grounds, individual plots, collections of flowers, grasses, vegetables, exhibits of individual vegetables and flowers; hand-writing, drawing and composition; sewing and baking, manual training, and poultry.

BRITISH COLUMBIA

The Department of Agriculture started on June 17th to issue its weekly Fruit Marketing Bulletin. Reports are given of the conditions in Washington and Oregon as well as in British Columbia, Alberta, Saskatchewan and Manitoba.

Fifth Annual Report of the Agricultural Fairs Association for the years 1914-1915: The total number of agricultural associations incorporated at the close of the year 1915 was 58; owing to the financial depression prevailing throughout the province, and owing to the absence of a large number of men at the front who are members, the report states that the affairs of most of the associations have been very quiet. The number of fairs held during the year was as follows: by agricultural associations, 47, by farmers' Institutes 7, fruit-growers' associations 1. The report contains detailed information with regard to each of the fairs held, including in each case, the report of the officiating judges, and embodies the proceedings of the fifth annual convention of the association held in Victoria in January 1910.

MISCELLANEOUS

A Review of Applied Entomology in the British Empire, by C. Gordon Hewitt, D. Sc., F.R.S.C., Dominion Entomologist, Ottawa. This is a reprint from the annals of the Entomological Society of America, of Dr. Hewitt's annual address to that society delivered at Columbus, O., on December 29th, 1915. Its historical importance vies with its scientific value.

The Agricultural and Animal Industrial Branch of the Department of Natural Resources, of the Canadian Pacific Railway, has issued a forty-page illustrated pamphlet on "Alfalfa"; its adaptation and value as a food for all classes of live stock, its beneficial effect upon the soil, and how to best plant, inoculate, grow and harvest the crop, with an appendix on Mixed Pasture Grasses. Don. H. Bark, Chief of the Irrigation Investigation Division, is the responsible author of a pamphlet that deals very thoroughly and practically with every phase of the cultivation, growth and value of alfalfa as a feed for cattle, horses, sheep and swine and as a fertilizer.

NOTES

During 1915 the state of West Virginia has closed by consolidation some 400 one-room schools.

The number of Women's Institutes in the province of Alberta increased from 42 in 1914 to 107 in 1915.

Mr. A. E. Meyer of Edmonton has recently been appointed to the position of Instructor in Animal Husbandry at the School of Agriculture, Olds, Alberta.

Two hundred boys in all parts of the province of Alberta have been furnished with one bushel each of specially selected seed wheat to demonstrate, in their respective localities, the possibilities of greater production by using selected wheat.

The potato club championship for the State of Massachusetts was awarded to Isadore Horin, of Westminster. This boy ranked second in the State in 1914. His 1915 report shows that he raised 114 bushels and 30 pounds of potatoes on one-fourth of an acre, at a cost of 30 cents per bushel.

Cochrane, Alberta—Although this is probably the highest altitude (3,748 feet) agricultural community in Canada, experience with alfalfa raising under irrigation has proved very successful, one settler having a fine 40-acre field. Popularity of alfalfa is spreading rapidly in Southern Alberta where, on account of irrigation facilities, it is already one of the most important crops.—*Canadian Pacific Railway Bulletin*.

The Saskatchewan Board of Highway Commissioners has asked *The Public Service Monthly* to publish in each issue an official list of all bridge and road construction work as authorized from time to time. Accordingly, commencing with the July number, the full list of works authorized up to the time of going to press will be given in the *Public Service Monthly*, and in each subsequent issue there will appear a list of the works authorized in the interval, giving the amounts in each case, together with any further sums which it may have been found necessary to grant to complete any work already authorized, where the sum originally granted has been found insufficient.

In the 1915 report of the Monteith Demonstration Farm in Northern Ontario, the cost of ploughing, harrowing, seeding, and harvesting one acre is given as \$7.42, divided as follows: ploughing new land, \$6.65, rolling 25c., discing 37c., and harrowing 15 cents.

Wm. J. Bonavia, Secretary, Fall Fair Associations in British Columbia, has published in circular form the list of Fall Fairs, which have been arranged by the Department of Agriculture. These number 66 in all, beginning August 14th, and lasting until October 14th.

T. A. Erickson, club leader of the State of Minnesota reports that in Kanabec county, where club work is just being started, the local bankers have raised \$1,000 to be loaned to the boys and girls in the pork and crop production club work, without interest, for the purchase of high-grade pigs. The club members give their notes to the bankers for the price of the animals, and these notes are to be paid in the fall after the pigs have been sold.

The oldest church west of the Mississippi river will celebrate its centennial anniversary next year at Ashland, Missouri. Although it has had a long history, this church is modern in spirit and methods. It is made of members of various denominations who join and object to any narrowly sectarian teachings. It recognizes its great opportunity to become a community centre and, since it is in a farming community, it co-operates with the Agricultural Extension Service of the University, eighteen miles away, for the purpose of securing speakers and the organization of a farmers' club.

Mrs. Herbert Peake, the Hon. Secretary for the Women's War Agricultural Committee in the southern part of Yorkshire, England, has organized a short training course at Plumtree Farm, Bawtry, for women willing to undertake work upon the land. The course will extend over a fortnight, and is intended for those who hope to take positions of responsibility on farms. Instruction will be given in milking, stock-tending, stable cleaning, wood-sawing; in the use and care of harness equipment; field labour—manure hauling and spreading; planting, hoeing, weeding, gathering and storing crops, and in the use of implements.

The plan for the home-garden work in North Dakota as outlined by the assistant state leader, is that 2 square rods will be the minimum requirement for those who are to work the garden by hand, and 4 square rods for those who will work with horse cultivator. Every club member in addition to making a report, exhibiting fresh products, studying and working out some of the market instructions, is also required to can at least 20 quarts of vegetables during the season.

The Alberta Department of Agriculture has purchased a young Holstein bull, King Segis Pontiac Alcartra 11th (175948), from John Arfmann, Middletown, N.Y. His sire is King Segis Pontiac Alcartra (79602), for which a half interest was sold in May, 1914, for \$25,000; while his dam is Manor Johanna Pietertje Lady (95017) with a record of 34.38 pounds of butter in seven days, her average per cent of fat being 5.2.

G. B. Curran, B.S.A., District Representative, Ontario Department of Agriculture in Lennox and Addington County, has recently completed a silo census for the county. This census reveals the fact that there are 233 silos in Lennox and Addington, practically all of which have been erected within the last four years, and in 1916, 80 new silos were erected. One hundred and seventy-one of the silos are constructed of wood and 62 are of cement. Mr. Curran points out that 90 per cent of these silos are in the southern part of the county in a section less than 20 miles square.

Macdonald College, incorporating the School of Agriculture, School for Teachers and School of Household Science, has an honour roll of about one hundred and fifty, representing the present and former members of the college staffs and employees, of graduates, under-graduates and former students and also of former pupils of the Macdonald Day School. Practically every department of the College is represented in the list of those who have gone forth to serve their King and country in the great war. Macdonald College is represented in a large number of units of the Canadian forces from the Atlantic to the Pacific, in the various Universities overseas companies of reinforcements to the Princess Patricia Canadian Light Infantry, in the Imperial forces, in the colonial forces and in the forces of France and Belgium. In addition to the men who have enlisted five women, including students and members of the staff, are giving their services in hospital duty.

At Orchard Lake, Ind., on May 17th, 1916, 75 Herefords sold for \$96,525, an average per head of \$1,287, being an average of \$512 per head better than the average at any of the seven previous annual sales at the same place. Superior Fairfax, a 3-year-old bull, brought \$10,000, being the highest price ever paid at auction in America for a Hereford. Twenty-five bulls sold for an average of \$1,996 and 50 cows for an average of \$932. L. O. Clifford, Oshawa, paid \$4,000 for Winifred Fairfax, a three-year-old cow, being the highest price at the sale for a cow or heifer. Mr. Clifford also paid \$1,625 for Miss Armour Fairfax, a four-year-old.

Figures furnished by the Bureau of Foreign and Domestic Commerce of the United States indicate that in the early months of the present year purchases of food-stuff on European account fell off considerably compared with the enormous quantities that were purchased in the corresponding months of the first year of the war. Food-stuff exports from the United States in the nine months ending with March show a decline in value of \$63,000,000 from the corresponding period of the year before. Shipments of meat and meat products increased, totaling within the nine months \$180,000,000 against \$132,000,000 the year before, but declining breadstuff exports reduced the aggregate value of food shipments from \$956,000,000 to \$893,000,000.

The Board of Agriculture and Fisheries, with headquarters at Whitehall Place, London, England, have published Special Leaflet, No. 59, on the subject of "Successful Employment of Women on the Land." The Board have obtained particulars of a number of cases in which farmers have employed women with satisfactory results. This information is contained in the leaflet as published. Instances are quoted where experienced and inexperienced women did good work in sowing seeds, in harvesting the potato crop, in apple picking, in ploughing, in milking cows and in dairy work. One farmer, who formerly employed 11 men, but latterly had six girls and one boy (freed from school owing to the war), and he hoped to obtain the services of one or two additional women, has found that at most kinds of farm work three unskilled girls are able to do the work of two ordinary farm men. A dairy farmer having 200 cows engaged two women to take the place of men. He found these so successful that he has now five women in his employment. The instances quoted in the leaflet are sufficient to show that women are capable of performing satisfactorily many forms of agricultural work.

A bulletin dated May 15th, issued by the Manitoba Department of Agriculture, states that from no part of the province is any decided demand for more farm help reported. One correspondent says: "The older boys are doing men's work on the farms, staying away from school to do so." This condition seems to be fairly general. Wages average about \$40 per month. The tendency to increase the number of live stock kept seems to be general, and there is an almost universal statement that the interest created in chicken raising through the Boys' and Girls' clubs will result in more poultry being reared this year. Exceptional interest is being taken in butter-making. In the week ending May 13th, the Winnipegosis creamery received 106 cans of cream from Ruthenian farmers at Sifton, Man.

The value of boys' and girls' projects is shown in the report for 1915 of the club leader of the State of Michigan. His report, published in the U. S. Department of Agriculture Farm Demonstration Monthly, May, 1916, is as follows:

	Members	Income
Gardening and canning.....	251	\$1,739.11
Potatoes	94	2,460.66
Corn.....	144	4,753.78
Beans	27	2,047.16
Garment making.....	74	362.78
Housekeeping	39	78.00
Poultry	27	589.79
Total.....	656	\$12,031.28

These are figures for one of the worst cropping seasons that the State has ever known. Two-thirds of the garden and potato club members lost their crops through frost, many others lost heavily through blight. In spite of these serious disadvantages and adversity the average income per club member was \$18.34.

C. M. McLennan, Associate Editor of the American Sheep Breeders' Journal, Chicago, in concluding a discussion of "The Wool Market" says: "My advice to Canadian Farmers would be: If you have sheep, hang on to them and buy more if you can get them. Follow the instructions of your association in regard to shearing and packing your wool, and market it through the association co-operatively where you get the benefits of competitive bidding. You can't go wrong. The American mills need your wool, if the Canadian mills do not, and if the Government restores the embargo on wool to this country, don't sell to the first bidder. Hold for a decent price and you will get it. If you own a farm and do not keep sheep, get them and get them quick, even if you are compelled to sell a few calves or hogs. 'The lamb has the floor and wool's the word these days.' Think it over."

The Ontario Department of Education has issued a circular directing the attention of teachers, inspectors and school boards to the advisability of impressing upon pupils, not only the present necessity, but the desirability at all times, of practising thrift. It is pointed out that thrift is a virtue, the exercising of which is intimately connected with the national welfare. The State, the circular says, relies on the saving and wise investment of money by individuals. In this connection the advantages of depositing the smallest savings in the Dominion Government Penny Bank are referred to and advocated.

The Hon. The Minister of Finance and Agriculture for British Columbia has sanctioned certain expenditures by the Department of Agriculture in connection with assistance to flower shows given by women's institutes in the province during the present year.

The assistance given may be summarized as follows:—

(1) A per capita grant of 25c. in addition to the grant made under the authority of the Agricultural Act, 1915, will be given to institutes holding flower shows or an exhibition of women's work, or a combined flower show and such exhibition.

(2) Prizes will be offered for competition at such shows for collections of bulbs, sweet-peas, roses, dahlias, and perennials, or other varieties as may be decided by the institute, the prizes to consist of books awarded by the Department, as follows:—adults, 1st and 2nd prizes; juveniles, three prizes.

During 1915 there were 45 acres under cultivation for crop production on the Monteith Demonstration Farm, of the Ontario Department of Agriculture. The following table shows the crop harvested in 1915 and in 1914:

	1915 Bush.	1914 Bush.
GRAINS		
Fall wheat.....	30	65
Spring wheat and mixed crop.....	50	50
Peas.....	15	27
Oats and peas, mixed.....	55	—
Barley, O. A. C. No. 21.....	50	200
Oats.....	900	350
Total.....	1,100	692
ROOT AND VEGETABLE CROPS		
Turnips.....	1,500	300
Parsnips.....	50	—
Carrots.....	20	—
Potatoes.....	30	150
Total.....	1,600	450
MISCELLANEOUS		
Red clover hay.....	50	28
Alfalfa hay.....	2	2
Straw.....	20	7

During the months of February and March, 1916, cooking demonstrations were held in a number of schools in the county of Pontiac, province of Quebec, by Miss Frederica Campbell, Macdonald College Demonstrator to Women's Clubs, assisted by Mr. J. K. King, the Macdonald College Demonstrator, and the various county executives of the homemakers' clubs. All demonstrations held were well attended. Instruction was given in the making of bread, cake and candy. Attention was drawn to the method of judging these articles at school fairs.

In the Horticultural Branch of the British Columbia Department of Agriculture no new lines of extension work are being undertaken this year. The Orchard, Truck Crop, Farm Garden and City Garden Competitions are being greatly extended. Experimental work in spraying, pruning, fertilizers, etc., is also being considerably extended. A series of meetings with regard to potato diseases, selection of seed potatoes, and potato culture, was held with a view to further improving the quality of British Columbia potatoes for export trade.

In the May, 1916, issue of THE AGRICULTURAL GAZETTE a number of contests, being conducted in the Weyburn Inspectorate, Saskatchewan, were outlined. In regard to these contests Mr. A. Kennedy, Weyburn, Inspector of Schools, reports good progress:

The first judging of the live stock entered in the contests has been done by Prof. W. H. Tisdale, of the College of Agriculture, Saskatoon. Four boys were met who will purchase sheep during the summer, the market not being satisfactory at the present time. These sheep will be ready for the first judging in October. One girl, twelve years old, has entered the contest in "Raising and Feeding Beef Cattle." Seventeen competitors have entered the "Poultry Contest" and 41 have entered the "Household Science Contest" in the Weyburn municipality. The Board of Directors of the Weyburn Agricultural Society have arranged for the admission of the competitors at the Fair to be held in Weyburn early in August. In Cymri, R.M. 36, including the villages, Midale, Macoun and Holbrite, 10 or 12 competitors have entered the "Swine Contest," 4 the "Sheep Contest" and 4 or 5 the "Beef Contest," while a large number are entered in the "Poultry" and "Household Science Contests," and a few are undertaking the "Manual Training Contest." The farmers in this municipality have manifested considerable interest in the movement, and a beginning has been made looking to a municipal agricultural school by the purchase of a plot of 22 acres of ground at the municipal centre—Midale.

On Monday, June 5th, at Toronto, the Blue Cross ambulance subscribed for by the horse breeding societies of Canada was formally handed over to the military authorities in presence of a large gathering. In the absence of the Minister of Militia, who was unable to be present, Colonel E. E. Clarke, Assistant Director of Supplies and Transport, Ottawa, received the presentation, which was made by Mr. William Smith, M.P., assisted by John A. Boag, president of the Clydesdale Horse Association, and Mr. H. M. Robinson, secretary of the fund committee and of the Hackney Society. The outfit, which was as perfect in detail as it could be made, comprised 16 saddle horses, 4 Clydesdale horses, military harness, saddles, extra traces, blankets, and stable utensils, medicine chests, surgical instruments, the latest form of ambulance, with slings, operating table, runway, etc., and a transportation wagon, all steel-covered, for carrying the requisite accessories. The saddle horses are to be used to help in tending and removing horses slightly wounded from the scene of battle, while the ambulance and Clydesdales attend to the more serious cases. The outfit was to be shipped to the fighting zone as a unit and as quickly as possible after the presentation.

At the annual convention of the Ontario Educational Association, Richard Lees, School Inspector, Peterboro, summarized the advantages of consolidated rural schools as follows:

(1) Greatly increased attendance both in enrolment and in the percentage of those enrolled.

(2) The possibility of the development of a spirit of co-operation and community interest through the school. This is not possible where there are only a few children, as there are in many rural schools at present. Half the rural schools of Ontario have less than twenty children attending, and many have less than ten.

(3) The country school comes to possess all the advantages that follow from the establishment of graded classes, properly equipped laboratories, and the teaching, under properly qualified teachers, of such subjects as agriculture, domestic science and manual training.

(4) The pupils of the country have, like the children in town, the privileges of a high school without going away from home.

(5) The school comes to be an institution of importance, appeals to the loyalty and pride of the people and becomes a centre for the activities of the community.

(6) Teachers cease to be isolated units and are brought together in groups where mutual help and co-operation are possible, thus making it easier to secure and retain the services of better teachers under more favourable conditions.

INDEX TO PERIODICAL LITERATURE

The Grain Growers' Guide, Winnipeg, March 22, 1916,

Canadianizing the Foreign Born, S. E. Greenway, Director, Extension Work, University of Saskatchewan, page 7.

Boy and Girl Farmers, A. W. Cocks, Director of School Agriculture, Province of Saskatchewan, page 8.

May 10—Town and Country Co-operation—A Successful Scheme of Livestock Promotion at North Battleford, E. A. Weir, B.S.A., page 9.

May 31—The Rural Community—A True Co-operative Effort Will Do for Country Life, George W. Russell, page 7.

Town and Country Co-operation—Article II—Livestock Promotion at Canora and Lethbridge—E. A. Weir, B.S.A., page 9.

June 7—Educating the Youth, page 6.
Country Church Failures, Washington Gladden, D.D., (of the First Congregational Church, Columbus, Ohio), page 7.

The Women's Institute Quarterly, Victoria, B.C., April, 1916.

Some Practical Suggestions in Sanitation in Rural Homes, Miss Alice Ravenhill, page 72.

How Can Women Assist in Food Production in 1916, Virginia H. Johnstone, page 92.

Country Life in Canada, Winnipeg,

May, 1916—Corn as a Substitute for Summerfallow, page 8.

June, 1916—Facts about the Horse Industry, page 6.

The Country Gentleman, Philadelphia,

May 8, 1916—Fire-Blight Insurance, Frank D. Kern, page 963.

May 13—Garden Insurance against Strikes—Flowers and Vegetables

Transform a Mining Community, Harry Snowden Stabler, page 10130.

June 17—Live Stock Insurance—Your Investment May be Protected against Death, H. T. Morgan, page 1218.

The Suburban Garden, John R. McMahon, page 1225.

The Canadian Countryman, Toronto,

May 20, 1916—Why Not More Potatoes and Beans in Ontario, page 6.

May 27—Profits made from Feeding Cattle, Mr. McMillan, Seaforth, Ont., page 3.

Farmer's Advocate & Home Journal, Winnipeg,

May 17, 1916—The Wool Market, C. M. McLennan, Associate Editor of the American Sheep Breeders' Journal, Chicago, Ill., page 723.

May 24—The Outlook for Draft Horse Breeding, Wayne Dinsmore, Secretary, of American Percheron Association, page 761.

Farmer's Advocate, London,

May 25, 1916—A Self-feeder for Swine, Geo. B. Rothwell, Assistant Dominion Animal Husbandman, page 914.

Culture and Use of the Bean Crop, page 915.

Canadian Farm, Toronto,

May 26—The Brood Mare and Breeding, by Dimlux, page 4.

The Agricultural Journal, Victoria, B.C.,

June, 1916—Credit Commission is Loaning Money to Farmers at 6½ per cent.—One Million Dollars is now being loaned by the Government in Moderate Amounts, by Hon. Wm. Manson, M.L.A., Chairman of the Agricultural Credit Commission, page 44.

Every Boy should Contribute to the Province's Bread-basket, J. W. Gibson, M.A., Director of Elementary Agricultural Education, Department of Education, page 47.

British Columbia Farmers should go in for Community Breeding, W. T. McDonald, M.S.A., Live Stock Commissioner, page 49.

Greater Attention to Technical and Industrial Training—Agriculture is not a One-professor Study—Aims of College of Agriculture, Dean Klinck, page 56.

The Farmer's Magazine, Toronto,

June, 1916—A Tremendous Fillip to Horse Breeding, John W. Hayes, page 9.

Social Needs of the Prairie: Why Should the Rural Communities be Divided into small Hostile Groups? J. S. Woodsworth, page 17.

A School of New Profits: What the Junior Farmers of Ontario are Doing to Prove their Methods in Figures and Results, Ethyl Munroe, page 19.

- Prairie Farm and Home*, Regina, Sask.,
May 31, 1916—Forces that Make and Break Rural Community Movements, page 8.
- Canadian Thresherman & Farmer*, Winnipeg,
May, 1916—Flax for Grain, J. H. Grisdale, Director Dominion Experimental Farms, page 27.
- Nature-Study Review*, Ithaca, N. Y.,
May, 1916—The Organization of Nature Study, Otis W. Caldwell, page 189.
- The Farm and Ranch Review*, Calgary,
May 5, 1916—The Elusive Live Stock Markets, C. W. Peterson, page 334.
- Monetary Times*, Toronto,
May 12, 1916—Canadian Business and Production, Fred W. Field, page 5.
- The Journal of Commerce*, Montreal,
May 16, 1916—The Sheep Industry in Canada, T. Reg. Arkell, B.S.A., page 3.
- The Journal of Agriculture and Horticulture*, Montreal,
June 1, 1916—School Credit for Home Gardens and Other Home Work, Sinclair Land, page 252.
- Manual Training and Vocational Education*, Peoria, Ill.,
June, 1916—The Effective Use of the School Farm: Record of an Unfinished Experiment, Robert J. Teall, page 762.
- B.C. Fruit and Farm*, Vancouver,
June, 1916—Pure Milk Problem, page 941.
- Canadian Poultry Journal*, Toronto,
June, 1916—Experiment Station Poultry Houses—Popular Poultry Houses In Use on Experiment Stations under Various Climatic Conditions, page.
- The Ohio Farmer*, Cleveland, Ohio,
June, 10, 1916—A Brotherhood of Fruit Growers—How Apple Growing was made a profitable industry in the land of Evangeline, A. J. Campbell, page 1.
- The Globe*, Toronto,
June, 14, 1916—Give Farm Boy Chance to Start on a Farm, page 15.
- Rural Credit—Its Effect on the Agricultural Industry,
A Lucas, M.P.P., *B. C. Fruit and Farm*, Vancouver, May, 1916, page 913.
- Potato Growing and the Maintenance of Soil Fertility,
W. W. Hubbard, Supt. Dominion Experimental Station, Fredericton, N.B., *The Maritime Farmer*, Sussex, N.B., May 2, 1916, page 486.
- Lightning Protection on the Farm,
W. E. Clark, *The Western Home Monthly*, Winnipeg, May, 1916, page 48.
- The Maritime Farmer*, Sussex, N.B.,
May 2, 1916—Potato Growing and the Maintenance of Fertility, W. W. Hubbard, Superintendent Dominion Experimental Station, Fredericton, N.B., page 486.
- The Western Home Monthly*, Winnipeg,
May, 1916—Lightning Protection on The Farm, W. E. Clark, page 48.

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DEPARTMENT OF AGRICULTURE

The Agricultural Gazette of Canada

EDITOR · J. B. SPENCER, B.S.A.

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CONTENTS

	PAGE
The Seed Fair and Crop Improvement.....	679
The Appointment of Mr. W. J. Black.....	680

PART I

THE DOMINION DEPARTMENT OF AGRICULTURE

The Dominion Experimental Farms:—	
The Poultry Division:	
Ventilation of Poultry Houses, by F. C. Elford.....	681
The Tobacco Division:	
Experiments being conducted at the Harrow Tobacco Station, by D. D. Digges.....	684
The Division of Animal Husbandry:—	
The Comparative Value of Concentrated Protein Meals for Dairy Cattle, Sheep and Swine, by E. S. Archibald.....	687
The Dairy and Cold Storage Branch:—	
Dairying in Prince Edward Island and Nova Scotia, by Geo. H. Barr.....	693
The Live Stock Branch:—	
Egg Exhibit at Calgary.....	695
The Health of Animals Branch:—	
Importations from Illinois.....	696
The Entomological Branch:—	
Controlling Apple Insects in the Province of Quebec, by C. E. Petch.....	697
The Seed Branch:—	
Subventions Paid to Seed Fairs, by Geo. H. Clark.....	698

PART II

THE PROVINCIAL DEPARTMENTS OF AGRICULTURE

Agriculture in Canada:—	
Saskatchewan, by F. H. Auld.....	700
The Ventilation of Poultry Houses:—	
Macdonald College, by M. A. Jull.....	709
The Oka Agricultural Institute, by Brother Wilfrid.....	710
The Manitoba Agricultural College, by M. C. Herner.....	712
Seed Fairs:—	
Prince Edward Island, by Theodore Ross.....	714
Nova Scotia, by M. Cumming.....	716
Quebec, by Had. Nagant.....	718
Ontario, by J. Lockie Wilson.....	720
Saskatchewan, by S. E. Greenway.....	724
Alberta, by J. McCaig.....	725
British Columbia, by H. O. English.....	726
The Canadian Seed Growers' Association, by L. H. Newman.....	729

	PAGE
Advertising Canadian Fruit:—	
Ontario, by P. W. Hodgetts.....	729
British Columbia, by R. M. Winslow.....	730
Farm Mechanics:—	
Nova Scotia, by M. Cumming.....	731
Macdonald College.....	731
Ontario Agricultural College, by John Evans.	732
Manitoba Agricultural College, by L. J. Smith.....	734
Saskatchewan College of Agriculture, by R. A. Greig.....	737
Alberta Schools of Agriculture, by James McCaig.....	738
Notes from District Representatives:—	
Quebec.....	740
Ontario.....	740
Quebec:—	
The Maple Sugar and Syrup Industry, by J. A. Grenier.....	742
Examinations at the Oka Agricultural Institute.....	745
Graduates of the School of Agriculture, Ste. Anne de la Pocatière	745
Ontario:—	
The Girl Guides.....	746
Alberta:—	
Convention of Weed Inspectors at Claresholm.....	746
British Columbia:—	
Rural Highways, by J. E. Griffith.....	747

PART III

RURAL SCIENCE

The Model Kitchen:—	
Macdonald College, by Miss A. E. Hill	748
Saskatchewan, by Miss Abbie De Lury.....	752
British Columbia, by Miss Alice Ravenhill.....	757
A Rural School with Ten Acre Grounds, by A. W. Cocks	763
The Ideal Rural School.....	764

PART IV

SPECIAL CONTRIBUTIONS, REPORTS OF AGRICULTURAL ORGANIZATIONS, NOTES AND PUBLICATIONS

The Unusual Rainfall—Memorandum by Sir Robert F. Stupart.....	765
The Agricultural College Library and Its Opportunity, by Mrs. H. W. Smith.....	766
New Publications:—	
The Dominion Department of Agriculture:—	
The Fruit Branch.....	767
The Provincial Departments of Agriculture:—	
Ontario.....	767
Saskatchewan.....	768
British Columbia.....	768
Miscellaneous.....	768
Notes.....	769
Index to Periodical Literature.....	770

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THE AGRICULTURAL GAZETTE of Canada is published monthly, in English and in French, by the Dominion Department of Agriculture. It is not intended for general circulation. A limited number of copies, however, are available to subscribers at \$1.00 per annum, or 10 cents per copy.

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THE SEED FAIRS AND CROP IMPROVEMENT

IT requires about forty million bushels of seed to plant the annual crop of cereals and potatoes in Canada. This includes 32,821,000 bushels of cereals and 7,179,000 bushels of potatoes. On the character of this seed the value of the crop largely depends. The estimate here quoted was made by the Secretary of the Canadian Seed Growers' Association, who holds the view that an increase per acre of five bushels of wheat, ten bushels of oats and ten bushels of potatoes, may reasonably be looked for as a result of using superior rather than such ordinary seed as many farmers plant.

Dr. C. A. Zavitz, Professor of Field Husbandry at the Ontario Agricultural College, found by repeated trials that the yield of grain crops was increased 19 per cent by the use of large, rather than small seed. Although no specific tests to prove the advantage of the use of plump, vigorous seed over that of poor quality have been carried out by the Dominion Experimental Farms, the Dominion Cerealists holds the view that the difference in yield would average not less than ten per cent. This is for good and poor seed of the same variety. There is, moreover, a vast difference between varieties. From tests carried on by the Federal and Provincial Governments it is estimated that another ten percent advantage may be secured by the use of the best sorts. That is to say plump seed of one of the few leading varieties will give ten percent more crop than plump seed of such ordinary varieties as are commonly used.

It is surprising that more farmers do not pay careful attention to the quality and variety of their seed. The Conservation Commission have looked carefully into this question. In their agricultural survey in 1915, out of one hundred average farmers in each of four good Ontario counties from eight to forty-seven percent did not know the name of any variety of grains sown. Only one man in each of two counties, and two men in one county, were found to practise a systematic selection of seed grain, and but from two to eight percent of the farmers questioned put their seed grain more than twice through the fanning mill. Surveys made in many other parts of Canada reveal even less careful work.

Considering together the attention paid to varieties selected, and the preparation of seed with regard to quality, it appears reasonable to estimate that the field crops of Canada would be increased at least fifteen percent if only plump seed of the best varieties most suitable to the respective localities were planted. The cereal crop of 1915 was estimated to have had a value of \$558,127,200, and the potato crop of \$35,964,000. Fifteen percent increase

would have returned the magnificent addition of \$89,113,680 from improved seed alone. But the use of improved seed also tends to improvement in cultural methods, still further increasing the returns from the land.

As an agent in working towards this result, the Seed Fair holds a prominent place. Initiated by the Seed Branch of the Federal Department of Agriculture, operated for a time on a co-operative basis, then

handed over to the Provincial Departments of Agriculture, along with annual financial aid, the Seed Fair is rapidly improving the agricultural industry. The manner and the extent to which this is being accomplished, are told in this issue by a representative in every province, save Manitoba and New Brunswick, where the system is as well developed as in the other provinces.

THE APPOINTMENT OF MR. W. J. BLACK

MR. W. J. Black, B.S.A., has been appointed Commissioner under the AGRICULTURAL INSTRUCTION ACT in succession to the late Mr. C. C. James.



MR. W. J. BLACK, B.S.A.
Commissioner under the Agricultural Instruction Act.

Mr. Black was born at Mansfield, Dufferin county, Ont., and spent his early days on a farm. He graduated from the Ontario Agricultural College in 1902. He was the first student

from Canada to take part in the student judging competition at the International Live Stock Exposition, Chicago. After being associate editor of the Farmer's Advocate, London, Ont., from June to December, 1902, he accepted the managing editorship of the Farmer's Advocate, Winnipeg, Man., a position that he filled for two years and resigned to become Deputy Minister of Agriculture for Manitoba. This latter appointment Mr. Black occupied from January, 1905, to December, 1906. In April, 1905, he organized and became president of the Manitoba Agricultural College, filling the dual position of Deputy Minister and president of the College for seven or eight months. In December, 1906, he relinquished the former office and, until September, 1915, retained the college presidency. From January, 1905, to September, 1915, he was also managing director of agricultural societies for Manitoba and organized the Home Economics Societies movement in the same province. In addition to the calls upon his time by these various undertakings, Professor Black found opportunity in 1910 to serve as a member of the Manitoba Commission on Technical Education. His last official appointment previous to the present was as secretary of the Economic Commission, formed last year.

PART I

Dominion Department of Agriculture

INFORMATION SUPPLIED BY OFFICIALS OF THE VARIOUS
BRANCHES REPRESENTED

THE DOMINION EXPERIMENTAL FARMS

THE POULTRY DIVISION

VENTILATION OF POULTRY HOUSES

BY F. C. ELFORD, DOMINION POULTRY HUSBANDMAN

EXPERIMENTS in the ventilation of poultry houses have been conducted at the Central Experimental Farm for years and during the past three years the question has been taken up at the branch

of glass and cotton properly arranged makes ideal ventilation for most sections in Canada.

As a rule, one-third glass and two-thirds cotton give us the best results. This, however, always allows



READY FOR THE CONCRETE

First the rough concrete goes on, then an inch or less of finish

farms throughout the Dominion as well.

The experiments have shown that the best ventilation is through the windows or front of the house. No elaborate system of ventilation has been satisfactory, but a combination

for about eighteen inches of wood along the bottom for protection for the hens on the floor. The arrangement of the glass and cotton depends upon the depth of the house. For houses not more than ten feet deep, eighteen inches of glass hori-

zontally above the eighteen inches of wood, and three feet of cotton above the glass, seem to be the best arrangement. For houses deeper than this the windows are put in vertically and may or may not go all the way to the ceiling.

In the more humid sections an additional device is adopted, that of a straw loft and openings in the gables.

arrangement with the addition of a straw loft.

This latter type (the straw loft) at Ottawa, last winter, was never known to have the slightest trace of moisture, while other types were more or less damp, in some cases the litter being wet and walls covered with frost or dripping. The straw loft, however, makes a house somewhat colder.



THE FLOOR AND FOUNDATION

The retaining boards and the narrow strip to hold the bolts in place and part of the filling-in material on the ground; note that all is on top of the surface, even the grass remains

The general proportions that we find best, therefore, are: eighteen inches above floor-wood, the rest of the front one part glass to two parts cotton. In narrow houses, the glass below and cotton above, in wide houses alternate the glass and the cotton. In moist climates the same

The construction of these houses is single board, except the north side and two ends as far as the roosts go, which is double and paper. The floor of movable houses is board, and of permanent houses cement. The cement floor is merely a slab placed on top of the ground.

THE FARMER'S POULTRY HOUSE

This house holds one hundred hens, is 16 by 32 feet and divided into two pens, each 16 feet square. The house has given satisfactory results on the Experimental Farms system for several years. It has been used in every province in the Dominion and may be built with a single roof or a double roof and a straw loft. In the drier sections of Canada the single roof is recommended, while for the more humid

parts the double roof and straw loft building is to be preferred.

SPECIFICATIONS

The floor merely a slab.—No trenches are dug for the foundations, the floor is laid upon the ground, the top of the floor being from 10 to 15 inches above the surrounding level.

Making the frame for the concrete.—Take enough boards to reach

around the outside of the building. Boards one inch thick will do and as wide as the height of the floor is to be above the surface. Set these boards on edge and stake them in position so that the inside of the boards is the size of the house. Level the top edges, nail lightly to the top edge a six-inch board so that it will project in over the floor. In this six-inch

is then put in, leveled with the straight edge to the top of the frame or retaining boards and smoothed off with a trowel.

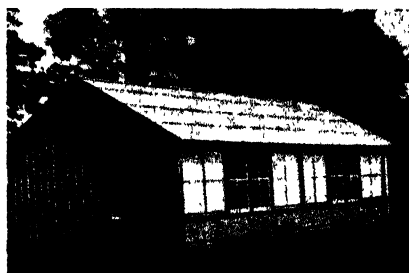
Proportions of sand, stone, cement.

—If broken stone and sand are used the mixture for the coarse concrete should be one bag of cement to two barrows of sand and four barrows of broken stone (about an inch and a half in diameter). The sand and cement are mixed together, then they are thoroughly mixed with the crushed stone, the whole wet with water, mixed again and used at once.

The finishing coat is composed of one bag of cement to one barrow of sand and three barrows of fine crushed stone, mixed as described above and used at once.

If gravel is used make the rough coat with one bag of cement to six barrows unsifted gravel, not too coarse, and for the finishing coat use one bag cement to two barrows of sand.

Walls.—The exterior walls consist of two by four studding, at centres shown on plans resting on a two by four sill, and supporting a plate of two by four. These studs



THE FARMER'S POULTRY HOUSE
The straw loft type just finished except the door to be placed in the gable

strip bore holes every 6 to 10 feet to take a $\frac{5}{8}$ -inch bolt. These bolts are for the purpose of holding the sill and should extend above the finished floor far enough to go through and screw down a 2 by 4 scantling. When the heads of these bolts become secured in the concrete remove the six inch boards that hold the bolts in position, so that the straight edge can be used to level the surface of the floor.

Filling in the stone and cement.—

When the frame is leveled and secured the stone may be filled in. This could have been dumped on the ground before with less trouble except that it might interfere with the leveling of the boards. Stone, brick, plaster, or anything of a like nature, should be used to fill up to about two inches of the top of the floor. There should be several inches left around on the inside of the frame to allow for concrete being placed there to form the wall. Then fill in with the concrete to the edges of the frame and to within $\frac{3}{4}$ or 1 inch of the finished floor surface. The finishing coat of cement



THE FARMER'S POULTRY HOUSE
The shed roof type, the openings above the windows are covered with cotton also

are covered outside with one ply of tarred paper and one inch T. & G. boarding, or one inch boards and battens.

On inside, behind and around the ends of the roosts, the studding is covered first with tarred paper then with one inch T. & G. boarding.

Inside partitions are built of studing, covered with wire mesh to within $2\frac{1}{2}$ feet of floor, rest of partition one inch boarding.

Roof.—The rafters are two by four at 20 inch centres, resting on the plate two by four. On these rafters, lay one thickness of one inch sheeting and ready roofing, or, if preferred, tarred paper and good cedar shingles, laid $4\frac{1}{2}$ inches to the weather.

Windows.—Windows are built be-

tween studs as shown, and fitted with frames for glass, or cotton where indicated. All sashes are hinged and swing in. Outside of all window openings is covered with one-inch wire mesh.

Doors.—The outside door frames are of two-inch stuff, rabbitted for one-inch battened doors. Any inside doors are made to match the partition and hung so as to swing both ways.

THE TOBACCO DIVISION

EXPERIMENTS BEING CONDUCTED AT THE HARROW TOBACCO STATION

BY D. D. DIGGES, SUPERINTENDENT OF THE TOBACCO STATION, HARROW, ONT.

WHILE the value of the research work being carried on in the laboratories, relative to soil quality, soil variation, and other numerous factors which influence and to a great extent determine the quality and quantity of tobacco produced on a given piece of land, can hardly be over estimated, still, it is a well known fact that, regardless of the persistence and care of the investigator in conducting his experiments and making his observations, he cannot always obtain the same results in actual field practice that he obtains in the laboratory. And so we find the need of the experiment station to serve the two-fold purpose of: first, co-operating with and corroborating the results obtained by the investigator in the laboratory; and, secondly, of combining the technical and the practical and presenting it to the grower in such a way that he cannot fail to derive the maximum of benefit from it.

In an effort to aid the grower in solving some of the problems now confronting him the Tobacco Division has undertaken the following lines of experimental work at the Harrow Tobacco Station:

1. To make a close study of the different types of seed beds, and determine the value of different soil treatments for the elimination of disease in the seedlings, and their value for the production of strong stocky plants.
2. To determine the merits of fall versus spring ploughing for tobacco as related to the conservation of moisture, better utilization of fertilizers, and destruction of insect pests.
3. To determine the best rotation for the tobacco producer to follow and the place in the rotation which tobacco should occupy.
4. Manure and fertilizer tests for determining the effect of direct and indirect applications of manure on the quality and final colour of the Burley, and research for the optimum formula of commercial fertilizers to be applied to the Burley and flue-cured varieties.
5. Study of the best methods of applying commercial fertilizers to tobacco.
6. Variety tests for determining the varieties of both types of tobacco best suited to various types of land and varying climatic and cultural conditions.
7. A study of the effect on the yield and earliness of different distances of planting the tobacco out.
8. Research for the most efficient insecticide, quantity to apply, and method of application in combatting the tobacco horn worm.
9. Selection and breeding with a view to improving the varieties grown and the originating of new varieties.
10. The production of tobacco seed.

11. In harvesting, to compare the split stalk and unsplit stalk methods, and the effect of each on the final colour and length of time required for curing.

12. Flue curing.

13. Investigation of scaffolding in the field versus direct air-curing to determine whether the time of the air-curing process can be shortened, and the final colour improved by scaffolding.

14. Investigation of the use of charcoal heaters in the air-curing of Burley for improving the colour and hastening the curing process.

15. The grading of Burley and flue-cured tobacco with the view of obtaining better prices for the better grades and determining the percentage of poor and good tobacco in the crop.

16. The establishment of varieties of Burley and flue-cured tobacco resistant to the Root Rot by the selection of disease resistant plants.

From the number of failures reported each year, in the production of strong early seedlings free from disease, we feel that there is still a broad field for investigation and improvement here, and since success in the growing of a profitable crop of tobacco is so largely dependent on a good supply of strong healthy plants, too much importance cannot be attached to the determination of the methods best suited to the production of the plants. In recognition of the above facts we are testing out, at Harrow, the following types of beds: first, hot beds, cold beds, and semi-hot beds, under glass; second, semi-hot beds under canvas; third, steamed beds; fourth, formalin treated beds.

That the practice of growing the same crop on a piece of land year after year is a very poor one, and one that is most likely to prove disastrous finally, has been proven over and over again. We have any amount of experimental evidence to prove that different crops draw upon the various elements of plant food in the soil in varying amounts. So in order to obtain the maximum of yield and at the same time keep the soil in the highest state of fertility possible, we must follow some system of crop rotation, in order to

avoid exhausting, or too greatly diminishing any one element of plant food.

Another matter by no means of minor importance is the elimination of plant diseases. Here again, we find one of the most formidable weapons both for combatting disease, once it is in the soil, and as a means of preventing its appearance in the soil, in the rotation of crops.

Now that we know the value of crop rotation there are two things left for us to do: first, to determine the most efficient and profitable rotation; second, since the preceding crop exerts a marked influence on the crop following, in many instances, to determine first where the tobacco crop should come in the rotation.

Regarding fertilizers and manures, we know that each element of plant food in a commercial fertilizer, and manure in various forms, has a more or less definite function to perform in producing the crop, and since tobacco is a highly specialized crop, the value of which depends on the quality and colour of the product, it is highly important that we determine when, in what forms, and in what quantities, to apply the manures and fertilizers in order to obtain the maximum yield, and at the same time the quality and colour desired.

After determining the kind and quantity of fertilizing materials which will be most beneficial, our next problem is to find out how to apply the fertilizer to obtain the desired results. Shall we apply it broadcast and thus lengthen the period of time required for the tobacco plant to utilize it; or shall we drill it in the row; or place it directly under the plant in the hill?

As each soil formation coupled with climatic conditions determines to a marked degree the texture, colour and flavour of the tobacco produced in any locality, so do these two factors coupled with

disease resistance render more profitable the growing of certain particular varieties of the same general type of tobacco, than other varieties of that type. Hence, the value of the varietal tests.

The distance of planting, that is the space allowed each plant in the field, is a factor of importance as regards the quality, and to some extent, the yield of the crop produced. Planting too far apart gives a coarse heavy product and may reduce the yield; while planting too close is liable to diminish too greatly the amount of plant food available for each plant and the amount of aeration and sunshine, giving, as a result, a plant with undersized leaves of poor texture.

A considerable amount of work has been done along the line of testing insecticides for combatting the tobacco horn worm. However, most of the insecticides tried so far have some objectionable feature; either a danger of burning the leaf, for example Paris Green, or too great a difficulty in applying the substance. So in view of the damage done by the worm and the high cost of labour there is much latitude for profitable investigation along this line.

INCREASE OF SPECIALIZATION

The tobacco industry is becoming more and more highly specialized; the manufacturers demanding tobacco of certain definite qualities, and either refusing to buy tobacco of a nondescript character at all or paying such low prices for it as to render the growing of such tobacco highly unprofitable. Thus we recognize the paramount importance of sowing good seed; for if we sow a nondescript seed the result will be a nondescript tobacco, regardless of the care taken in the production and handling of the crop. In recognition of the above facts and the knowledge that, as a rule, the growers sell their crops to the same manufacturer each

year, we hope to undertake, at Harrow, the production of seed of the various types and varieties which approach nearest the requirements of the manufacturers and supply them to the tobacco growers.

Tobacco curing, at least in the first stages, is a life process. In curing the leaf undergoes certain chemical changes, while the leaf cells are still alive, at the same time losing a large part of the water contained at the time of harvesting.

Investigations have shown that the rate at which this water is lost during the curing process has a very important effect on the final result. Drying out too quickly kills the leaf and stops the curing process, while, on the other hand, prolonging the drying process too long carries the curing process too far.

We frequently have very unfavourable weather at curing time, and since the rate of evaporation of the moisture contained in the leaf can be greatly influenced by different methods of harvesting, it is very essential that we study these methods in order to enable us to meet varying climatic conditions successfully.

During the season for the air-curing of Burley, we often have periods of warm, damp weather when the atmosphere is so full of humidity as to render practically impossible the evaporation of the moisture contained in the leaf. This condition causes the tobacco to sweat, and if continued for any period of time may cause houseburn and give a dark coloured product. This condition can be largely remedied by the use of artificial heat, which will increase the water carrying capacity of the atmosphere in the barn and cause a draft.

It is under such conditions as the above mentioned that we hope to demonstrate the value of the charcoal heaters in conjunction with the shortening of the curing process.

Every season we are assailed with

the cry that the price of tobacco is so low as to render the growing of the crop almost unprofitable. While we are not going to attempt to place the blame for the low price of tobacco, we do feel that if some system of grading the crop could be inaugurated among the growers, it would certainly be a revelation to some of them regarding the amount of really poor tobacco which is being produced; and it would serve to make them study more closely their methods of growing and handling the crop; with a result that a much

greater quantity of first class tobacco would be produced.

In conclusion, the above outline of experiments is a very brief synopsis of the work now under way or to be undertaken at Harrow this year; and, we intend to keep in close touch with every phase of the tobacco situation, and enlarge the scope of the work being done as conditions arise which demand expansion; always keeping in view the practical needs of the grower and exerting every effort to aid in the production of a better and higher priced product.

THE DIVISION OF ANIMAL HUSBANDRY

COMPARATIVE VALUE OF CONCENTRATED PROTEIN MEALS FOR DAIRY CATTLE, SHEEP AND SWINE

BY E. S. ARCHIBALD, B.A., B.S.A., DOMINION ANIMAL HUSBANDMAN

THE average farmer is unable to produce sufficient of the highly proteinaceous foods to supply the wants of a large dairy herd, nor is it considered profitable for him to try to do so. By purchasing these concentrates and turning his attention to the growing of large amounts of succulent and palatable roughages, the farmer increases the stock-raising capacity of his farm and at the same time is adding considerable fertilizing constituents in a very cheap form. The

present line of experiments was outlined in an endeavour to help the farmer to choose his concentrates.

OBJECT OF EXPERIMENT

The object of the experiment was to compare the relative value, palatability and economy of three of the most commonly used protein feeds, namely, linseed oil cake, cottonseed meal and gluten feed, as well as two new feeds which have only lately been put on our markets, namely fish meal and peanut oil meal.

DAIRY CATTLE

PLAN OF EXPERIMENT

As many cows as could be had, that were giving a sufficient quantity of milk to be affected by such a small change in the ration, were used in the different divisions of this experiment.

The meal mixture and dates of periods are given herewith. It will be noticed that the cows got the same number of pounds of protein in each period, although the nutritive ratio may vary somewhat:

Period	Date Starting	MEAL MIXTURE FOR PERIOD—LB.
1	Dec. 7, 1915	Gluten feed, 400; bran, 400; ground oats, 200.
2	Dec. 21, 1915	Fish meal, 85; bran, 400; ground oats, 200; gluten feed, 200.
3	Jan. 4, 1916	Gluten feed, 400; bran, 400; ground oats, 200.
4	Jan. 18, 1916	Cottonseed meal, 125; bran, 400; ground oats, 200; gluten feed, 200.
5	Feb. 1, 1916	Gluten feed, 400; bran, 400; ground oats, 200.
6	Feb. 15, 1916	Linseed oil cake, 170; bran, 400; ground oats, 200; gluten feed, 200.
7	Feb. 29, 1916	Gluten feed, 400; bran, 400; ground oats, 200.
8	Mar. 14, 1916	Peanut meal, 110; bran, 400; ground oats, 200; gluten feed, 200.
9	Mar. 28, 1916	Gluten feed, 400; bran, 400; ground oats, 200.

As will be noted, each period consisted of two weeks, the last week only being used for computation, the first being considered as a transition period.

During the first period all cows received as much roughage as they would clean up and the same amount during the remainder of the experiment. This amounted to approximately 10 lb. of turnips, 35 lb. of ensilage, and 6 lb. of hay per cow, per day.

The grain mixture was fed at the rate of 1 lb. for every $3\frac{1}{2}$ lb. of milk produced during Period 1, and this amount was continued per cow, per day, during the following periods. Any grain refused was removed, weighed, and credited to the cow.

Value of feeds per ton: Hay, \$7; turnips and ensilage, \$2; bran, \$20.50; gluten feed, \$32; oil cake, \$28; cottonseed meal, \$33; fish meal, \$80; ground oats, \$30; peanut meal, \$40.

SUMMARY

The object of this experiment, as stated previously, was to compare the relative value, palatability and economy of the feeds used. Taking first the question of palatability, it may be said that in the proportions used all the meals were palatable, as they were all eaten readily. However, it is just possible that in the case of the fish meal and peanut meal larger quantities in the ration would affect the palatability, because the former is inclined to be a little rancid owing to the presence of some oils, while the latter is slightly bitter, due to the presence of the peanut hulls.

The relative value and economy of the meals can be arrived at from a study of the following table, in which the various feeds are classed in the order of their cheapness of production of milk and of butter and also showing the cost of the grain ration per cow per period together with the nutritive ratio of the same:

SUMMARY OF PRODUCTION

PERIOD	Feed	Average milk per cow per day	Fat per cow per day	Remarks
		Lb.	Lb.	
Average Period 2	Fish meal	24.0	.97	Cows gained flesh
" 1 & 3	Gluten feed	23.3	.89	Cows lost flesh
Average Period 4	Cottonseed meal	25.7	1.00	Cows gained flesh
" 3 & 5	Gluten feed	26.2	1.01	Cows neither gained nor lost flesh
Average Period 6	Linseed oil cake	27.3	1.07	Cows gained flesh
" 5 & 7	Gluten feed	26.6	1.01	Cows gained flesh
Average Period 8	Peanut meal	27.34	.98	Cows gained flesh
" 7 & 9	Gluten feed	27.5	1.07	Cows gained flesh

FEEDING PERIODS	Meal	Cost to Produce 100 lb. Milk	Cost to Produce 1 lb. Butter	Cost of Grain Ration per Cow per Period	Nutritive Ratio of Grain Ration
		Cts.	Cts.	\$	
Period 6.....	Oil meal	67.7	14.7	1.29	1:3.0
Periods 5 & 7.	Gluten feed	67.7	15.0	1.25	1:3.6
Period 4.....	Cottonseed meal	68.7	14.9	1.24	1:3.1
Periods 3 & 5.	Gluten feed	67.7	14.8	1.25	1:3.6
Period 8.....	Peanut meal	68.8	16.3	1.32	1:3.0
Periods 7 & 9.	Gluten feed	67.7	14.7	1.25	1:3.6
Period 2.....	Fish meal	77.7	16.9	1.31	1:2.96
Periods 1 & 3.	Gluten feed	73.7	16.3	1.25	1:3.6

As previously stated, the amount of the various meals used was based on their protein content so that the pounds of protein in the ration would be the same in each case, consequently any change in the amount of milk or butter produced would be brought about by the change in the quality of the protein. At the same time the change to a meal high in protein, such as fish meal, meant a reduction in the amount of meal used, which, even with the higher cost of the meal in question, lowered the cost of the concentrated protein in the ration considerably. This, however, was offset by the fact that an additional amount of the other meals used was necessary to make up the total number of pounds of grain feed in the ration, thus balancing up the cost of the grain ration until there was only a difference of 8 cents per cow per period, between the cost of the cheapest and dearest ration. In studying the table, it must be remembered, however, that the figures given will hold good only when the feeds can be obtained at the prices quoted. Any change in prices will change these figures accordingly. All rations are suitable for milk production if the prices of the concentrates will warrant their purchase.

A further comparison on a strictly commercial basis may be made as follows:—

In Part I of this experiment 110.6

lb. of fish meal plus 44.61 lb. of bran and 22.26 lb. of oats took the place of 215.7 lb. of gluten feed. Therefore, with the other three feeds at the prices mentioned, fish meal is worth \$48 per ton for milk production.

It is peculiar to note that production dropped so sharply after the fish meal ration ceased and that the cows did not regain normal production until nearly the end of the subsequent period (No. 3) on gluten feed. All other periods of gluten feed in the succeeding experiments comparing gluten with other meals were very uniform, and the lower production on gluten in period 3 is probably due to the sudden change from the distinctive characters of the fish meal ration.

In Part II, 136.1 lb. of cottonseed meal plus 40.6 lb. of bran and 20.3 lb. of oats took the place of 177.1 lb. of gluten feed. Therefore, with the other three feeds at the prices quoted, cottonseed meal is worth \$30.86 per ton for milk production.

In Part III, 188 lb. of oil cake plus 3.18 lb. of bran and 2.09 lb. of oats took the place of 216.82 lb. of gluten feed. Therefore, according to the same reasoning, oil cake is worth \$36.32 per ton for milk production.

Lastly, in Part IV of the experiment, 129.3 lb. of peanut meal plus 45 lb. of bran and 22.5 lb. of oats took the place of 190.1 lb. of gluten feed, thus giving peanut meal a valuation of \$34.65 per ton for milk production.

SWINE

The work was conducted with eleven groups of pigs, consisting of five groups in duplicate and one single.

Each group contained five pigs, selected uniformly.

Lots 1, 2, 3, 4, 5, 6 were pigs from 4 to 6 months of age.

Lots 1a, 2a, 3a, 4a, 5a (duplicates) were pigs from 2 to 3½ months of age.

MEAL RATIONS

Lot	MEAL	Lb.	Shorts	Lb.	Ground Barley	Lb.
1	Ground corn.....	200	Shorts	400	Ground barley	400
2	Gluten feed.....	200	"	400	"	400
3	Cottonseed meal.....	125	"	400	"	400
4	Linseed oil cake.....	170	"	400	"	400
5	Peanut oil meal.....	110	"	400	"	400
6	Fish meal.....	85	"	400	"	400

Skim-milk was fed with all of the above meal mixtures.

The prices charged for gluten feed, cottonseed meal, linseed oil meal, fish meal and peanut meal were the same as given above. Corn was valued at \$32, shorts at \$23, barley

at \$30, and skim-milk at \$4 per ton

COMPARATIVE VALUES OF FEEDS

In the above rations, when gluten feed is valued at \$32 per ton, the other feeds showed the following valuations per ton:

FEED	With Older Pigs	With Younger Pigs
Corn.....	\$18.53	\$29.48
Cottonseed meal.....	87.76	58.19
Linseed oil meal.....	60.20	57.89
Peanut oil meal.....	2.73	69.30
Fish meal.....	13.78	.....

AVERAGE OF RESULTS OF EXPERIMENTS 1 AND 1A

LOT	1 and 1a, Corn	2 and 2a, Gluten	3 and 3a, Cotton- seed	4 and 4a, Linseed	5 and 5a, Peanut	6, Fish Meal
First weight..... Lb.	458	382	302.5	330	265	531
Finished weight..... "	970.5	884	849	866.5	730	775
Gains for period..... "	512.5	502	546.5	536.5	465	244
Cost of feed..... \$	21.73	20.63	18.10	19.02	17.40	11.51
Cost per pound gain..... Cts.	4.2	4.1	3.1	3.5	3.9	4.7
Average standing (costs).....	5th	3rd	1st	2nd	4th	Highest
Average standing (gains).....	3rd	4th	1st	2nd	5th	Lowest
						gains

Where fed in quantities governed by their varying protein content, it would appear from these experiments

that:—

(1) Cottonseed meal is capable of producing low-cost gains; that it is a

safe, palatable feed when used in the proportions indicated.

(2) Linseed oil meal may be regarded as practically the equal of cottonseed meal, the two lots having stood first and second in both experiments, both in cost to produce and gains made, with only a slight difference in results.

(3) Peanut meal, while it stands low in the comparative gains made, shows up well in the cost of production, due to the relatively small quantity necessary when fed on a protein basis. The lot fed peanut meal made a much better showing in the duplicate experiment, due to the fact that the pigs were not subject to the untoward influences affecting the individuals of the first experi-

ment. While they equalled the cottonseed fed pigs in cost of production in Experiment 1A, they nevertheless evidenced lack of uniformity in condition and relish of their meal ration.

(4) Gluten meal and corn meal fed in equal quantities in the ration gave results showing little difference, the slight superiority being in favour of the corn fed pigs. The latter, however, were better and more uniformly finished.

(5) Fish meal, as fed in Experiment 1, proved palatable, but even fed as one-tenth of the meal ration caused intestinal disturbances sufficient to seriously affect economy of production with this lot.

LAMB FEEDING EXPERIMENTS

On October 13, 1915, one hundred lambs were purchased for experimental feeding purposes. This flock, composed of ewes and wethers, was in good, uniform condition for a period of finish feeding, the fall pasturage throughout the locality having been excellent. From October 13, until November 17, these lambs were pastured on good clover aftermath and third growth, which from the feeder's standpoint would otherwise have been wasted, the greater part of the sod being subsequently fall-ploughed.

On November 17, the entire flock was divided into five lots, and each lot subdivided into long-keep versus short-keep lambs. After individual weighing of the lambs the experiment was commenced.

PLAN OF EXPERIMENT

Meal mixtures are herewith given for the individual groups. Each lot received the same foodstuffs throughout the experiment. All lots were as uniform as possible as to weight and condition.

Lot No.	Pen No.	MEAL MIXTURE—LB.
1	1	Corn (cracked)..... 100; bran, 100; whole oats, 300
2	2	Gluten feed..... 100; " 100; " 300
3	3	Cottonseed meal..... 60; " 100; " 300
4	4	Linseed meal..... 80; " 100; " 300
5	5	Peanut meal..... 55; " 100; " 300

The prices charged for the feeds were as in above experiments, and oats at \$30 per ton.

COMPARATIVE VALUES OF FEEDS

In the above rations, when gluten other feeds showed the following feed has a value of \$32 per ton, the valuations:—

FEED	Short-keep Lambs	Long-keep Lambs
	\$, per ton	\$, per ton
Corn.....	29.28	35.22
Cottonseed meal.....	23.75	4.27
Linseed oil meal.....	—1.10	—15.71
Peanut oil meal.....	68.43	26.49

**AVERAGE OF GAINS, COST OF PRODUCTION AND PROFIT PER ANIMAL IN
EXPERIMENTS 1A AND 1B**

Lot	Average Gain per Animal			Cost to Produce 1 Lb. Gain			Net Profit per Animal		
	1a	1b	Aver.	1a	1b	Aver.	1a	1b	Aver.
	lb.	lb.	lb.	cts.	cts.	cts.	\$ c.	\$ c.	\$ c.
Lot 1, Corn.....	10.8	18.7	14.75	4.3	10.1	7.2	1 85	1 99	1 92
Lot 2, Gluten.....	11.2	18.2	14.7	4.1	10.3	7.2	1 82	1 86	1 84
Lot 3, Cottonseed....	10.1	15.7	12.9	4.6	11.9	8.25	1 77	1 66	1 72
Lot 4, Linseed	9.5	13.1	11.3	5.0	14.7	7.6	1 66	1 33	1 50
Lot 5, Peanut.....	12.8	17.5	15.15	3.7	11.0	7.35	2 03	1 83	1 93

The general conclusion from this experiment is that finishing lambs will make cheaper and greater gains on a ration containing a high proportion of carbohydrates and fat and a relatively low proportion of pro-

tein, this spread becoming more pronounced as the animals near a prime finish. Rations fed Lots 1 and 2 are specially recommended for finishing.

ORDER OF EXCELLENCE OF MEALS IN ABOVE EXPERIMENTS

	MILCH COWS		FINISHING LAMBS		FEEDING PIGS	
	Production of Milk and Fat	Economy of Production at Prices Quoted	Total Gains	Economy of Gains at Prices Quoted	Total Gains	Economy of Gains at Prices Quoted
Gluten feed, 23 per cent protein	1st	1st	3rd	1st	4th	3rd
Linseed oil meal, 35 per cent protein	2nd	2nd	4th	4th	2nd	2nd
Cottonseed meal, 43 per cent protein.....	4th	3rd	4th	5th	1st	1st
Peanut oil meal, 41 per cent protein	3rd	4th	1st	3rd	5th	4th
Fish meal, 63 per cent protein.....	5th	5th	.....	.....	6th	6th
Corn.....	.....	.....	2nd	1st	3rd	5th

THE DAIRY AND COLD STORAGE BRANCH

DAIRYING IN PRINCE EDWARD ISLAND AND NOVA SCOTIA

BY GEORGE H. BARR, CHIEF, DAIRY DIVISION

THERE is probably no province in the Dominion making as great an effort to improve the quality of the cheese and butter in 1916 as is Prince Edward Island. I think I am correct in saying that the dairymen of Prince Edward Island have been for several years "drifting". No particular effort was being made to keep the quality of the cheese and butter up to the highest point of perfection.

At the Dairymen's Convention held in Charlottetown last January, interest was awakened by the reading of reports from the produce merchants in Montreal and Great Britain on the quality of the Island cheese and butter. These reports convinced the delegates present that there was room for improvement in the quality of their cheese and butter and if they were going to compete successfully in the different markets, there would have to be an improvement in the methods of caring for the milk and cream at the farms, a general improvement in the condition of the factories and equipment, and in the methods of manufacturing.

PUBLICITY WORK

An agitation for better quality in dairy products was carried on in the local newspapers during the winter and spring months which resulted in many of the factories being repaired and made more attractive and sanitary, new equipment installed and a splendid enthusiasm on the part of the makers for a finer quality of goods.

To assist in creating a further interest among the patrons, a series of dairy meetings and picnics was

arranged by Mr. Harvey Mitchell, Maritime representative of the Dairy Division, Ottawa, and Mr. J. A. Clark, B.S.A., Superintendent of the Dominion Experimental Station, Charlottetown. Unfortunately, wet weather interfered to some extent with the success of the picnics. Notwithstanding the unfavourable weather, the attendance was from 100 to 700. Addresses were delivered at each gathering by Dr. Gauthier, St. Louis, P.E.I., local agricultural experts and the writer.

Five creameries are grading cream this year and the quality of the butter is being decidedly improved. There is no doubt that as the season advances, the quality of the cheese and butter from Prince Edward Island will be equal to that of any of the other provinces.

To Mr. Harvey Mitchell is due the credit for inaugurating and carrying out so successfully the campaign for better quality in Prince Edward Island dairy products.

CREAMERY PROGRESS IN NOVA SCOTIA

In Nova Scotia the production of creamery butter has increased during the last seven years over 400 per cent. Under the supervision of Prof. Cumming, Secretary for Agriculture, and W. A. MacKay, Superintendent of Dairying in the Province, new creameries have been erected in suitable places throughout the province for the shipping of cream by rail. Nearly all these creameries are owned and operated by joint stock companies. The charges for manufacturing the butter include the transportation charges on cream,

which places the farmer who lives 50 or 60 miles from the creamery upon exactly the same basis as those close by. This arrangement has a good deal to do with the splendid development of the industry in the province. The local government is encouraging the industry by granting a small cash bonus to new creameries erected at points approved by the Dairy Superintendent. The government has also erected and is operating two creameries in Cape Breton, where there has been very little interest taken in dairying, and the successful operation of a creamery is difficult on account of the small herds and large territory which it is necessary to cover to get a sufficient quantity of cream. The interest that is now being taken in the creameries in these two districts is indicated by the fact that at a picnic arranged by the patrons of the Margaree Creamery on July 11th there were between 1,200 and 1,500 people present.

POPULARITY OF DAIRY PICNICS

Dairy picnics were arranged for at five creameries in the province during the first two weeks in July. The total attendance at these was over 3500. The speakers were Prof. Cumming and Prof. Trueman of the Agricultural College, Truro, N.S., W. A. MacKay, Superintendent of Dairying, Harvey Mitchell, Supervisor of Cow Testing in the Maritime Provinces, and the writer. Premier Murray attended the Margaree picnic.

At the Scotsburn picnic a judging competition on dairy cattle was conducted by Prof. Trueman in the forenoon with both pure bred and grade cattle. In one class of grades, every cow in the ring had produced over 300 pounds of fat in the year. These records are the result of the cow testing work in the district.

Dairy or creamery picnics conducted along such lines are not only a source of pleasure and enjoyment to the farmers and their families,

but they create a lively interest in the creamery work and a friendly sociable feeling in the neighbourhood.

The dairymen in Prince Edward Island and Nova Scotia are to be congratulated upon their judgment in encouraging and stimulating the interest in dairying by mixing in with its strenuous work some of the enjoyments associated with the old time picnics.

Out of the 22 creameries in Nova Scotia, seven are grading the cream this year. Several of the creameries have installed pasteurizers and one has an up to date mechanical refrigerating plant.

THE FUTURE PROMISING

In both Nova Scotia and Prince Edward Island the cream is delivered at the creameries in individual cans. Tags are attached to the cans when returned, with the weight of the cream entered thereon. At the creameries where the cream is graded, white tags are used for 1st grade cream and coloured for 2nd grade. This has a wonderful effect in securing a better quality of cream, as no one wants to have a coloured tag attached to his can.

The question of grading creamery butter and cheese at Charlottetown and Halifax is being considered by the dairy authorities.

Dairying in the Maritime Provinces at the present time is in need of a large and thoroughly equipped dairy school where the cheese and butter makers could gather during a short course in the winter and thus keep in close touch with the latest methods of dairying in all its branches and where local dairy problems could be worked out at any time.

Prospects are exceedingly bright for bumper crops in the Maritime Provinces this year. These conditions, together with the prospect of an increased production of butter and cheese and the prevailing high prices for farm produce, should mean an exceedingly good year for the farmers down by the sea.

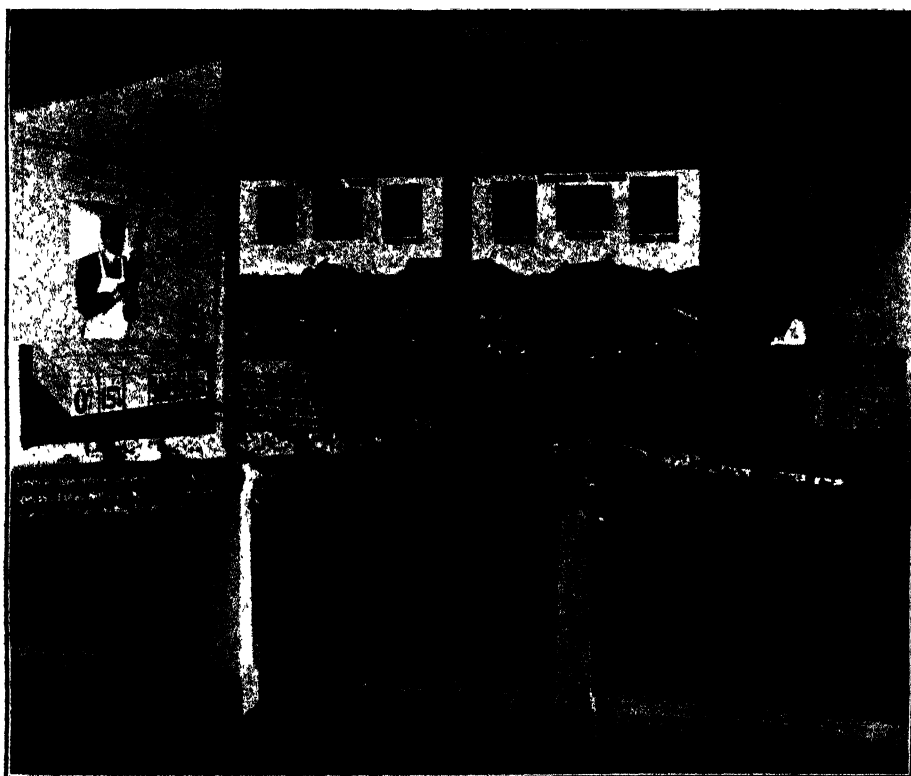
THE LIVE STOCK BRANCH

EGG EXHIBIT AT CALGARY

ONE of the most attractive features at the recent Calgary Exhibition, and one which drew much attention to the Art building, where it was located, was the egg exhibit made by the Live Stock Branch of the Dominion Department of Agriculture. It was on the recommendation of the Department that the fair at Calgary, for the first time, included in its

premium list, prizes for eggs graded in accordance with the Canadian standards.

The remunerative prizes offered resulted in a gratifying response on the part of producers and members of the trade. The eggs were displayed in an attractive manner, and were arranged in accordance with the market designations now generally recognized commercially by the



EXPLANATION

(Left centre picture)

NOTE:—High percentage of No. 1's, No. 2's, BAD and DIRTIES as result of STOCK being mongrel and nondescript, not properly housed nor properly fed; MALE BIRDS never removed from flock; EGGS gathered irregularly from many nests, kept in hot kitchens, traded for goods at local store on a flat rate basis, frequently held in damp, musty cellars and sheds near kerosene and other bad smelling substances.

EXPLANATION

(Right centre picture)

NOTE:—High percentage of SPECIALS and EXTRAS as result of STOCK being pure bred, well fed and housed in clean, sanitary quarters; MALE BIRDS removed after breeding season; EGGS collected and marketed frequently and regularly, kept covered at all times, candled and graded when purchased and paid for in cash according to quality, never held but shipped promptly in clean, dry fillers and cases.

trade throughout Canada, namely specials, extras and No. 1's. The educational value to producers and others competing, in thus requiring them to study their eggs in order to grade them properly, is no less great than the object lesson to consumers. In all, some 450 dozen eggs were on exhibition.

The Department erected in the Art building a large candling booth in which continuous demonstrations were given, and this, combined with the egg exhibit presented by the Live Stock Branch, constituted one of the distinctly educational features of the fair. The exhibit proper consisted of two large scenic illustrations, the one representing an improved, and the other an antiquated, method as followed in the production and marketing of eggs. These illustrations, together with their accompanying views of the interior of candling rooms in the various warehouses, where the eggs are classified, into their respective grades, the percentage being indicated in each case, present to the producer and the first receivers of eggs a rather remarkable object lesson, and one which, were the principles applied in every-day practice, would result in

a tremendous improvement in the quality of eggs marketed.

The exhibit was presented under the direction of the Dominion Live Stock Commissioner and under the immediate supervision of the Chief of the Poultry Division.

Relative to the foregoing, the Live Stock Commissioner says:—

"Regarding the egg classes, I may say that, following the example set by the Canadian National Exhibition at Toronto last fall, and the Ottawa Winter Fair in January last, some fifteen, in all, of the larger exhibition associations in Canada are including in their premium lists classes for eggs graded in accordance with the Canadian Standard defined in the March number of THE AGRICULTURAL GAZETTE, this year.

"The officers in charge of the Exhibit at Calgary report much interest in the Exhibit, between ten and twelve thousand people having viewed the demonstrations given in the candling booth, and between twelve and thirteen hundred having left their names for candling appliances and literature prepared for distribution in connection with the Egg Trade Improvement Campaign being conducted by this Branch."

THE HEALTH OF ANIMALS BRANCH

IMPORTATIONS FROM ILLINOIS

THE Veterinary Director General gave notice on July 14th, 1916, that the following order came into effect:

"The special restrictions against the importation of live stock, their

products, and other commodities, from the state of Illinois will be repealed on the 17th instant. After that date, therefore, importations from the state of Illinois will be permitted under the usual regulations."

THE ENTOMOLOGICAL BRANCH

CONTROLLING APPLE INSECTS IN THE PROVINCE OF QUEBEC

BY C. E. PETCH, B.S.A., FIELD OFFICER, DOMINION ENTOMOLOGICAL LABORATORY,
HEMMINGFORD, QUE.

LATE in July, 1912, an entomological field laboratory was established in Mr. G. B. Edwards' orchard, Covey Hill, Que., and remained there until late in the summer of 1915, when it was moved to Hemmingford, Que. The increased use of the laboratory this season proved the value of its removal, and as a source of information it is becoming more popular each year. The laboratory was established chiefly for the investigation of the many fruit pests which considerably lessen the total of marketable fruit.

The fruit-growers have been working under a handicap for many years, because the necessary information for the control of their insect enemies was not available. It has been our endeavour to acquire this information and distribute it through some means, such as lectures at horticultural meetings, or by coming directly into contact with the growers.

In 1912, a study of general conditions was made and the conclusion was soon reached that clean cultivation was difficult or impossible in many sections, owing to the roughness of the land. Thus one of the most important factors in insect control was unavailable. During the years 1910-1914 the tent caterpillars were very serious pests throughout the province, the height of their destructiveness being reached in 1912. Large numbers of apple trees have been seriously injured and in many cases killed outright by their attacks, but such injury has indirectly resulted in a decided increase in spraying. For the past two years the

tent caterpillars have considerably diminished and spraying has increased until practically every orchard of any commercial value in the apple-growing districts is now sprayed. Not only is the practice of spraying increasing, but the quality of the work done is improving and the eagerness for information is very marked. The effect of such a beginning will be felt for some years to come, when other pests will have to be combatted; for the pioneer work will have been done and directions will be followed intelligently.

The tent caterpillars are not alone in the work of destruction, but are materially assisted by the apple curculio, plum curculio, apple maggot, bud-moth, buffalo tree-hopper, flat-headed and round-headed apple-tree borers, and several other insects. During the years 1912 to 1915 the life-history and control of the apple curculio and the plum curculio were studied, and this year the apple maggot is receiving special attention.

The apple curculio is found generally distributed over the southern portion of Quebec province, but it is more injurious in the counties of Huntingdon and Chateauguay. It not only causes young apples to drop, but results in the production of mis-shapen fruit, the apples containing many hard green cores, and being, therefore, unfit for sale. A similar statement may be made as regards the injury caused by the plum curculio. The brown tunnels found in the apples are the well-known work of the apple maggot or railroad worm, which is common in certain

districts of the province. This year the biology and control of this insect are receiving special attention.

In the spring of 1915, spraying demonstration work based on the results of our studies was carried on in nine orchards at Franklin Centre, Que., and was extended to a few other districts this year. This work is carried on in co-operation with the Quebec Department of Agriculture, which supplies the spray materials and some of the power sprays. During the course of the work the fruit-growers were taught how to prepare the spray materials. While the work was being carried on, the value of spraying was made clear to the growers, and they were taught the reasons for employing different methods of control for different kinds of insects. General satisfaction with the work was expressed because the fruit was never so free from injury as last year, except for

the work of one insect—the apple maggot, which is being investigated this year. Among the worst pests for the past four years in this district were the tent caterpillars, but they were completely controlled where spraying was done. Other facts which impressed the farmers were the great saving of time and labour and the accompanying increase in the efficiency of the work by employing a power machine. Observations in this district, and the results of spraying in other localities, lead to the conclusion that such demonstration work would be beneficial in many places. In addition to spraying demonstrations, the farmers are given advice on the control of the insects attacking their various crops.

The work at the Hemmingford field station in the future will be conducted along lines similar on the whole to those followed in the past.

THE SEED BRANCH

SUBVENTIONS PAID TO SEED FAIRS

BY GEORGE H. CLARK, B.S.A., SEED COMMISSIONER

S EED fairs with which are associated field crop competitions, were first organized by the Seed Branch with the co-operation of the Provincial Departments of Agriculture and their agricultural societies. The district officers of the Seed Branch organized the competitions in their respective districts. Judges of the competitions were also supplied free. Prizes were provided in the earlier years for provincial seed exhibitions that received, in addition to the services of judges, a refund of one-half the money paid out in prizes up to a maximum of \$250. In 1912 a new policy was authorized by the Minister. Under the new arrangement the organization of the field crop competitions and seed fairs and provincial seed exhibitions, the selection and pay-

ment of judges, were taken care of by the Provincial Departments of Agriculture. The assistance given by the Federal Department through the Seed Branch since then has been financial, on the basis of a refund of two-thirds of the money awarded in prizes, with certain limits. Each province may receive in subvention towards field crop competitions and seed fairs and provincial seed exhibitions, a maximum of \$50 for each of five kinds of crops, for which classes are provided in a field crop competition conducted by one agricultural society; \$50 for each seed fair, and \$600 for a provincial seed exhibition. The maximum subvention which any province not having more than one million acres of land under field crops may receive is \$1,500, while the province having more than this area

may receive subvention in the proportion of \$1,500 for each million acres in field crops as shown by the census returns.

The following table shows the number of field crop competitions,

seed fairs and provincial seed exhibitions held during the fiscal year 1915-16 and the amounts of subventions paid to date for each of these services in each of the provinces:

SUBVENTIONS PAID ON ACCOUNT OF FIELD CROP COMPETITIONS AND SEED FAIRS. FISCAL YEAR 1915-16

PROVINCE	Amount Paid to Field Crop	No. Held	Amount Paid to Seed Fairs	No. Held	Amount Paid to Prov. Seed Exhibitions	No. Held	Total
Prince Edward Is.	\$ 711.34	9	\$ 200.00	4	\$ 446.00	1	\$ 1,357.34
Nova Scotia.	1,136.70	12	240.32	5	187.00	1	1,564.02
New Brunswick.	645.33	9	300.00	6	419.00	1	1,364.33
Quebec.	3,790.00	80	1,934.51	39	450.00	1	6,174.51
Ontario.	12,950.48	195	113.53	4	1,133.34	2	14,197.35
Manitoba.	258.65	7	1,179.10	34	600.00	1	2,037.75
Saskatchewan.	2,194.67	21	1,584.33	52	300.67	1	4,079.67
Alberta.	2,756.68	21	1,303.23	31	400.00	1	4,459.91
British Columbia	1,500.00	63	...	...	...	...	1,500.00
Total	\$25,943.85	417	\$6,855.02	175	\$3,936.01	9	\$36,734.88

A summer school for teachers commenced at Macdonald College, Quebec, on August 1st and will continue to the 25th. The object of the course is to give certificated rural school teachers an opportunity to qualify for teaching nature study and elementary agriculture. The school has provided five courses, as follows: Nature Study, Plant Life, Horticulture and Gardening, Animal Life and Art. A nature study and elementary agriculture certificate is to be awarded to those students who complete the course satisfactorily. A bonus of \$15 will also be paid to each of such students. The course is under the supervision of Dr. F. C. Harrison, Principal of Macdonald College, and of Sinclair Laird, Head of the School for teachers. The lecturers arranged for are: D. W. Hamilton, Ph.D., B.S.A., Lecturer in Nature Study and Elementary Agriculture, Nature Study and Plant Life; J. E. McOuat, B.S.A., Elementary Agriculture and Plant Life; Miss Edith Doane, Instructor in Drawing, Lectures and Demonstrations in Art; A. H. Walker, Horticulture and Gardening.

PART II

Provincial Departments of Agriculture

AGRICULTURE IN CANADA

SASKATCHEWAN

BY F. H. AULD, ACTING DEPUTY MINISTER OF AGRICULTURE

SASKATCHEWAN" and "Wheat Growing" are almost synonymous. Half a life time ago Saskatchewan was the centre of the great lone land, now it is the centre of the grain production of Canada and was the producer of half of Canada's wheat in 1915.

AREA AND DESCRIPTION

Saskatchewan has a land area of 155,764,480 acres and a water surface of 5,323,520 acres. A line drawn from east to west, a little north of Prince Albert, marks the division between the agricultural south and the practically unexplored north. Northern Saskatchewan is known to possess valuable resources in timber, minerals, fish, fur and game, although on account of their limited development their annual production ranks in importance far below agriculture. South of township 64 lie the great prairie lands which have made Saskatchewan so well known. This area contains 86,826,240 acres, of which possibly 50,000,000 acres rank as arable land of the first or second class. About half of this southern portion is level or undulating prairie, while the remainder varies from open park country diversified with light poplar bluffs to rougher land in the districts east and north of Prince Albert heavily timbered with spruce.

WHEAT-GROWING DISTRICTS

The districts where soil and climatic conditions favour wheat growing are, to use a general classification, those south of the Qu'Appelle river, west of the Last Mountain and the Quill Lakes and south of the main line of the Canadian Northern Railway west of Humboldt. This is an arbitrary and very general division and the area therein dedicated to wheat growing contains some splendid mixed farming country just as the area outside these boundaries contains a few splendid wheat growing districts. Flax may be grown in any part of this area as well as oats, barley and winter rye. But the area north and east of the boundary I have outlined is better adapted for the growing of oats than of wheat. It also produces abundantly both rye and barley and a luxurious growth of both native and tame grasses, which, with an abundance of natural shelter, render it especially suitable for live stock production and for dairying.

THE RANCHING STAGE

The earliest settlers in Saskatchewan followed pastoral rather than agricultural pursuits. Horses and cattle were grown extensively, while in a limited and restricted area sheep ranching was practised. The short,

thick natural grasses of the range, cured where they grew, afforded pasturage in winter as well as in summer, and the Chinook wind was relied upon in the south-west to clear away the snowfall and render the grasses available for stock. If it failed to do so heavy losses were only averted when hay was available in sufficient quantities. But this was the exception rather than the rule, and the occurrence of severe weather with a heavy snowfall was the main menace of the cattle or sheep rancher. Horses are better rustlers and were more independent of the Chinooks.

for the production of all kinds of live stock.

The historic range has now been parcelled out to homesteaders, but the live stock industry instead of suffering will be carried on along different lines and greatly extended. Ten or more acres to support a steer was the basis for stocking the range. We shall leave it to the farmers of Saskatchewan to see how many cattle can be profitably raised on ten acres without reducing our export of wheat.

THE ERA OF WHEAT GROWING

While the ranching stage marks



HERDING CATTLE NEAR KANASTON, SASK.

The passing of the range is now, however, almost a matter of history except in so far as the rougher lands are concerned and save for those areas preserved from settlement through being leased for grazing purposes. But in such districts as the Moose Mountain, Wood Mountain, Cypress Hills, Beaver Hills, Touchwood Hills, Last Mountain, and generally through all the country tributary to the main line of the Canadian Northern Railway, thousands of splendid specimens of grass-fed beefs are marketed annually, and these localities will some day rank with the best on the continent

the first period in the development of agriculture in Saskatchewan, the second may be described as the era of wheat growing. The wheat-growing period is again divided by the discovery by Angus McKay of the system of summer fallowing, which was almost epochal. By this discovery crop uncertainty was very largely removed and owing to the success which attended the efforts of the pioneer grain growers, Saskatchewan soon became the third province of Canada in point of population and the first in grain production.

Before the completion of the railway in 1885 homesteaders were

attracted to the valley of the Qu'Appelle and to districts north and south of it west of the Manitoba boundary. It is also interesting to note that even in the early days of wheat growing in Saskatchewan bonanza farms were not unknown. The Bell farm at Indian Head and the Tanner farm at Qu'Appelle are notable examples, and at about the same time Sir John Lister Kay's farming experience was being obtained. Settlements of English, Scotch and Canadian farmers came early, and even by 1886, colonies from Germany, Finland, Sweden, Iceland, Roumania and Hungary

thousands of farmers from Eastern Canada, Great Britain and continental Europe, while the more recent American "invasion" from the Western States is so well known as to require no comment.

ACTUAL AND POTENTIAL GRAIN PRODUCTION

According to the Dominion Census of 1911 the land occupied at that time in Saskatchewan was 28,642,973 acres, of which possibly one-third is not yet under cultivation. The same authority estimates the area of possible farm land in



WADENA CREAMERY, WADENA, SASK.

were being planted at various places in the eastern part of the province, which have done their share in developing the country. But previous even to this there were settlements of whites at Fort Ellice, Touchwood Hills, Carlton, Prince Albert and Battleford, and it is related that it required the use of four threshing machines for six months to thresh the Prince Albert wheat crop of 1879. These were the pioneers, "the first low wash of waves where yet shall roll a human sea," who were followed, not immediately but within a few years, by

Saskatchewan at 93,459,000 acres. Since the bumper crop of 1915 was grown on 10,967,160 acres it is a safe guess that the area of occupied farms in 1916 is not more than a third of the foregoing estimate of possible farm land.

These figures of area and occupancy are interesting from the standpoint of production, as they indicate a potential development of grain growing to a billion bushels in a single season. A crop in excess of 319,000,000 bushels was grown in 1915 from less than 11,000,000 acres, half of the crop being wheat, while

sixteen years ago six and three-quarter million bushels of grain from 642,000 acres was considered a great accomplishment. Wheat is, of course, the principal export crop, of Saskatchewan and all of the surplus of suitable quality after providing for local flour mills and seed requirements is exported. Oats are becoming more of an export crop, although the greater part of this crop continues to be used locally for feeding. Barley is not largely grown. Flax was in great favour a few years ago because of the high price, because of the acre yield re-

choicest quality of grain. Seager Wheeler has become almost a national celebrity through his painstaking care in growing and preparing exhibition grain. In 1911, he won the championship of America at the New York Land Show. In 1913, Paul Gerlach of Saskatchewan won the championship for wheat at the Dry Farming Congress. At the national exhibition, Dallas, Texas, Hill & Sons won for the third time the world's prize for the best peck of oats. At the Dry Farming Congress in 1915, Saskatchewan won first and second for hard spring wheat and



CUTTING WHEAT NEAR MOOSEJAW, SASK.

quiring less storage space relatively than other crops, and because it could be grown on newly ploughed prairie the same season. It has since fallen somewhat into disfavour, partly because of the facility with which it spreads weeds, but mainly because of the decline in values.

SOME PRIZE WINNERS

The success of Saskatchewan exhibitors of grain at national and international exhibitions of soil products proves the suitability of the province for the production of the

first for hard winter wheat and white oats, with firsts also for alfalfa, brome and rye grass, and several other premiums in addition to firsts and championships. Seager Wheeler again drew first and championship at this exposition.

MIXED FARMING COMING

It is neither desirable that the present methods and practices in agricultural production should be followed indefinitely nor probable that they will not soon change. As surely as the period of ranching was

succeeded by the era of wheat growing will the development of mixed farming supersede exclusive grain growing. The "summer-fallow", a necessary part of grain growing under the present system, while immediately profitable is immensely wasteful of nitrogen and humus and has already developed a serious condition known locally as "drifting", which means that the finely pulverized top soil is readily transported by strong winds, to the loss of the owner, and his neighbour as well, if it contain seeds of noxious weeds. Exclusive grain growing favours the spread of noxious weeds and interferes with their control.

a very limited market value as forage. But if sufficient stock were kept to convert the crop into milk and beef, and wool and mutton, greatly different results would be obtained.

Live stock farming as compared with grain growing is more dependent for its success upon an adequate supply of water, and this more than anything else is the determining factor with regard to the number of stock which may be maintained on any farm, or in any district in Saskatchewan. Important sections of the area which I have described as being adapted to wheat growing are still inadequately supplied with water



THRESHING SCENE ON THE 1500 ACRE FARM OF JOHN GILROY, GOVAN, SASK.

Live stock farming is the only permanently successful and economically profitable way of dealing with the problem of noxious weeds and "drifting" soils, and while the public generally may not be prepared to admit the fact it is becoming more and more apparent. I may illustrate my point by referring to wild oats, under our conditions one of our most serious noxious weeds, which soon ceases to be a problem when crops of oats or fall rye are grown and used as hay. The "hay" would be too abundant on many farms to be consumed by the present supply of live stock and would be expensive to market, besides having

for stock, and until this problem is solved the farmer cannot be expected to progress in stock raising. Conditions differ from the balmy days of the ranching industry when the rancher's corrals were near some water course and his stock ranged the plains. Unless a local supply of water is available it is not now expedient under farming conditions to drive the stock even a few miles to water, nor to draw water to the stock. It is right, however, to say that in many districts where water is lacking the attempts to obtain it have been insufficient to prove the non-existence of a suitable water supply, and it is not unlikely that

more persistent efforts will bring success. Much is possible in providing a water supply by collecting the run off from the fields and slopes into natural basins, and there retaining it for future use. The heavy impervious clay prevents much wastage by percolation and this condition almost invariably obtains where subterranean water is difficult to find.

HORSES

At an early date some of the horse ranchers began the use of draft stallions for breeding purposes, although most of them used thoroughbred sires and raised a lighter type of animal. At present the use of sires of the draft breeds is the rule rather than the exception, as the accompanying enrolment figures for 1916 indicate:—

Clydesdale.....	1,868
Percheron.....	670
Shire.....	68
Standard Bred.....	189
Hackney.....	52
Thoroughbred.....	27
French Canadian.....	1
French Coach.....	3
German Coach.....	7
Suffolk.....	36
Belgian Draft.....	126
Saddle Horse.....	6
Shetland Pony.....	1
Morgan.....	1
Jack.....	1
Total pure breeds.....	3,056
Grades.....	606
Crossbreds.....	2
Scrubs.....	584
Total.....	4,248

Advanced legislation with respect to horse breeding provides for the annual enrolment of all stallions used for breeding purposes and the examination and licensing of all stallions used for service in municipalities included in the Licensed Stallion District. This measure has been found effective in driving out unsound and inferior animals and in encouraging the introduction and use of a better class of stallions. Saskatchewan Clydesdales are famous throughout

Canada as representative of the best development of this famous breed, and show ring champions both male and female are owned by Saskatchewan breeders. The following figures indicate the development of the horse-breeding industry in Saskatchewan. Figures for 1881 and 1891 are for Alberta and Saskatchewan combined: In 1881, 10,870; in 1891, 60,976; in 1901, 83,801; in 1911, 507,468, and in 1915, 667,443.

CATTLE

The dual-purpose cow is the popular type of bovine in Saskatchewan. Shorthorns and Shorthorn grades predominate. Hereford and Aberdeen Angus, while popular in some districts, are less numerous in the province. Grade cows of Holstein and Ayrshire breeding have been introduced to a limited extent by the Saskatchewan Government, and sold on credit terms under its live stock distribution policy, but the use of bulls of the dairy breeds is not general and there is little if any indications of a tendency in this direction, although dairying is increasing rapidly in popularity and importance. Jerseys are regarded as unsuitable for Saskatchewan.

Statistics show an imposing development of the cattle industry in Saskatchewan. Although a division has not been made between ranch and farm stock, the balance except in the earlier years is largely in favor of the latter. The figures for 1881 and 1891 include Alberta cattle:

In 1881, 12,872; in 1891, 231,827; in 1901, 268,779; in 1911, 633,638, and in 1915, 931,561.

There is only one large abbatoir in Saskatchewan, located at Moose Jaw, but a large number of cattle are slaughtered locally for home consumption. Saskatchewan, however, supplies only slightly less than half of the cattle marketed at Winnipeg. If these animals were consigned to Saskatchewan markets it would doubtless result in a large proportion

of the unfinished animals, which are numerous, being returned to the farms for winter feeding. At present a Royal Commission is investigating the question of the marketing of Saskatchewan live stock and live stock products and, if as a result of their investigations and recommendations, there should develop local markets which would absorb the bulk of the stock marketed from this province, the feeding on our farms of the unfinished portion of the receipts would probably be a direct result. Few if any of these animals are returned under present conditions from Winnipeg, and persons desirous of feeding have restricted opportunities of buying animals which leave the province.

able originally to the Merino and Rambouillet breeds, but also possess blood of the medium wool breeds.

Sheep ranching was followed mainly in the south-west, and only in a restricted area therein could lands be leased from the Dominion Government for sheep ranching. The range ewes have proven a profitable farm investment, and mated with rams of the popular mutton breeds produce in a couple of generations a very suitable type of sheep for our western farms. A few pure-bred flocks are kept in Saskatchewan consisting of Shropshires, Oxford Downs, Leicesters, and representatives of a few other breeds. Statistics show that there were 144,370 sheep in Saskat-



FARM HOME AND BUILDINGS OF R. D. FAIRBAIRN, CARNDUFF, SASK.

It has been proven by test in the districts where natural shelter is plentiful and water available that cattle will winter outside and make substantial and profitable gains if fed sheaf oats or other suitable rations. Freedom from tuberculosis is claimed for cattle raised and fed under these conditions.

SHEEP

The noxious weeds problem is responsible for the recent introduction of many flocks of sheep on prairie farms where, owing to the lack of suitable fences, they were formerly strangers. Many of these new flocks consist of range ewes which are trace-

chewan in 1915 as compared with 114,216 in 1911 and 66,048 in 1901. There were 64,920 in Alberta and Saskatchewan in 1891 and only 346 in 1881. The live stock distribution policy of the Saskatchewan Government and the annual sales held by the Saskatchewan Sheep Breeders' Association have materially assisted in the establishment of promising farm flocks in Saskatchewan during the past five years. Coyotes and dogs are a constant source of danger, but the greatest obstacle is the comparative lack of fenced farms.

SWINE

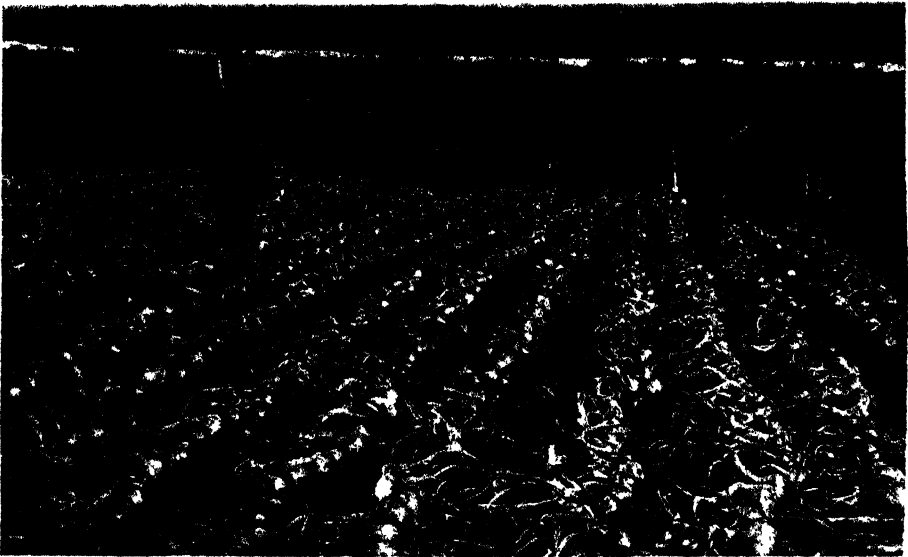
The barometer of prices for hogs

rather than for *pork products* is a fair index of the fate of the hog. On a rising market, money is invested in brood sows, and when prices fall sales are heavy. But the man who stays with the game gets what there is in it and with recent prices there should be considerable. The bacon hog is the kind generally raised in Saskatchewan, and the Yorkshire is the favourite, with the Tamworth a runner-up for first place, but not very close. The fat, quick-maturing Berkshire, however,

in Alberta and Saskatchewan in 1891, 16,283, and in 1881, 2,775. There is practically no limit to the possibilities of hog-raising in Saskatchewan when provision is made for a supply of suitable forage.

DAIRYING

No description of Saskatchewan agriculture would be complete without a special reference to the dairying industry. The development of co-operative dairying in



ONIONS—A SPLENDID MONEY-MAKER AND POPULAR CROP AROUND SASKATOON

has his backers as well. The bulk of the hogs exported from Saskatchewan go to Winnipeg; Saskatchewan supplying 237,403 head for that market in 1915, in addition to several thousand head slaughtered at Moose Jaw and at local points throughout the province. During 1914 and 1915, Saskatchewan supplied more than half the hogs marketed in Winnipeg.

There were said to be 329,246 hogs in Saskatchewan in 1915; 286,295 in 1911; 27,847 in 1901, and

Saskatchewan really dates from 1907, although several creameries were started about 1895, when, owing to uncertain returns from grain growing due to an imperfect knowledge of right tillage operations, it was deemed that the establishment of creameries would impart agricultural stability to the country. However, when success began to attend wheat growing, the support of many of the creameries languished and of the original creameries only two are still in operation, although large

privately owned plants have replaced four of the original co-operative enterprises. More success, however, was attained by the co-operative creameries which survived this period and those subsequently organized, although in 1907 there were altogether only six creameries operated in Saskatchewan. Four of these were operated under the direction of the Dairy Commissioner and one of them was privately owned and operated. The four operated by the Dairy Branch had 213 patrons and manufactured 66,246 pounds of butter. Fifteen co-operative creameries were operated under the direction of the Dairy Commissioner in 1915 with an output of 2,012,401 pounds. Eight independent creameries in 1915 manufactured only a little less than the co-operative creameries and have increased their annual output very largely each year.

Much of the present success of creamery industry in Saskatchewan is due to the thorough and progressive policy introduced by the Dairy Commissioner about 1907, which provided, among other things, for the uniform management under Government supervision of the co-operative creameries which desire it, the centralization of creameries to be erected and a measure of assistance from provincial funds for the payment of express charges on cream shipments, the payment for cream on a quality basis, the marketing through one office of the products of all creameries operated by the Dairy Branch, and the grading of all export butter.

More than half of the creameries in Saskatchewan are in the mixed farming districts, or in cities, but a few are located in what are essentially wheat-growing districts. That the latter are doing a successful business is another indication that Saskatchewan agriculture is proceeding along sane and progressive lines.

There are no cheese factories operated in Saskatchewan, as the

comparatively sparse settlement favours the manufacture of butter in centralized cream-gathering creameries.

FRUITS AND VEGETABLES

The space at my disposal does not permit of further reference to the agricultural development of Saskatchewan, but while grain and live stock are at present the staple products of this big province, nowhere can a finer quality of small fruits and vegetables be grown than in Saskatchewan. True, there is not the variety which obtains in more southern climes, but the quality and quantity which can be produced of those kinds for which the climate is well adapted, leaves nothing to be desired.

ORGANIZATION OF EXTENSION WORK

Organizations through which the best information available with respect to agricultural production is extended are the agricultural societies and homemakers' clubs, under the direction of the College of Agriculture, and the Grain Growers' associations. There are 126 agricultural societies, with a total membership of about 20,000, which are paid legislative grants of \$50,000 per annum in proportion to work actually performed. The homemakers have 160 clubs with a large membership. The Grain Growers' locals in Saskatchewan number about 1,400 and the membership is approximately 35,000.

The College of Agriculture has supervision and direction of extension work, although in the performance of its executive duties the Department of Agriculture exercises an influence. Agricultural secretaries and district representatives also take an active part in the work of agricultural betterment, and while the various agencies have not achieved their ideals they each have much useful work to their credit.

THE VENTILATION OF POULTRY HOUSES

The importance of maintaining a dry atmosphere in poultry houses is recognized by all authorities and successful poultrymen. In view of its importance, and the constant development of the poultry industry, there has been here brought together the views and experiences of the chief poultrymen at a number of the Canadian agricultural colleges and schools:

MACDONALD COLLEGE

A HOUSE FOR FIFTY HENS AS BASIS OF CONSIDERATION

BY M. A. JULL, B.S.A., MANAGER AND LECTURER, POULTRY DEPARTMENT

THE health of poultry, especially during the winter season of confinement, depends to a large extent upon a comfortable house providing abundance of fresh air.

The proper ventilation of poultry houses has long been a perplexing problem. From time to time many devices have been suggested regarding the proper ventilation of small and large houses. From a practical standpoint, however, the chief object has been to provide the house with plenty of fresh air, at the same time avoiding draughts, and to keep the house free from dampness.

One of the surest indications of an improperly ventilated poultry house is the condensation of moisture on the walls, ceilings and floors. A certain amount of moisture is given off by the fowls in breathing and in other ways, and thus the air of the house must be continually changed to avoid dampness. The foul and vitiated air which contains carbon dioxide as well as other injurious gases falls to the floor, and if it is not carried off regularly the atmosphere of the house becomes excessively damp, and during cold weather this dampness collects upon the walls and ceilings in the form of rime.

As a means of providing adequate ventilation the writer does not advocate installing special devices such

as the King or Rutherford systems of ventilation. Rather it would seem advisable to adopt a simple method of automatic ventilation. If fresh air from the outside is admitted gradually and allowed to diffuse with the air inside, the fowls will usually be found to do well. The air of the house may be rather cold, but if it is dry, egg production will not be seriously affected. In practice it has been found that open front poultry houses are the most satisfactory.

CONSTRUCTION OF THE POULTRY HOUSE

Form.—The best form for a poultry house is square or rectangular. The house must have sufficient depth to avoid draughts and give protection. One great objection to a large number of poultry houses in the province of Quebec is that they are too shallow and consequently give rise to draughts sweeping from one end of the house to the other.

Dimensions.—The smaller the flock the larger the floor space required per bird. For a flock of fifty hens the writer would suggest from five to six square feet floor space per bird. A house 16 feet by 16 feet, or one 20 feet long by 15 feet deep, would be most satisfactory. The average poultry house should be about 15 feet deep in order to

give the fowls the required protection while on the roosts.

Floor.—The most satisfactory floors are of concrete. They are more durable and more sanitary than board or earth floors; they do not tend to cause dampness in the poultry houses. On the other hand, concrete floors only become damp in an ill-ventilated house. The concrete floor, contrary to public opinion, tends to absorb the moisture.

Walls.—Double-boarded walls, with a dead air-space, are preferable for the Quebec climate; the double boarding is not necessary in the front of the house. In order to give the required ventilation cotton or open front houses have been adopted with good satisfaction. Such houses provide automatic ventilation where the cold air on entering the house gradually diffuses with the warm air

and tends to keep the atmosphere dry. In practice the houses are kept open as much as possible; cotton is used only in extremely cold weather, otherwise a portion of the house is kept open the year round.

Ceilings.—The writer believes that a double-boarded ceiling, above and below the rafters, will tend to overcome the collection of rime on the ceiling. On the other hand, it has been found at Macdonald College that poultry houses with straw in the gables have a drier atmosphere throughout the winter months than all other houses. Where the gable is filled with straw there is a false ceiling in the house with slats one-half inch apart, and the straw tends to absorb the moisture. At the same time it should be pointed out that straw in the gable provides an excellent harbour for mice and rats.

THE OKA AGRICULTURAL INSTITUTE

BY BRO. WILFRID, POULTRY MANAGER

The following is a summary of observations made on the subject of Ventilation of Poultry Houses. It constitutes an account of the methods found most efficient by experiments covering twelve years in keeping a dry and healthy atmosphere in the poultry house. This is a very important consideration which has engaged the attention of poultrymen since modern poultry houses have existed.

Climatic conditions vary to such an extent in the various parts of Canada, there is so much difference in the situation of poultry houses, in the manner in which these houses are cared for, that no absolute and uniform rule applying to all parts of the country can be laid down; some localities are subject to high winds, others to excessive dampness, to extreme cold, to prolonged storms, or the quantity of sunshine is only moderate; on the other hand, there

are districts where these unfavourable conditions do not obtain, or very seldom occur.

The diversity of opinion on this subject is probably increased by the fact that cotton front poultry houses do not always ward off dampness, nor provide for sufficient ventilation.

To provide for a so-called "perfect" ventilation, it is now stated that at least two thirds of the front should be in cotton and the rest in glass. This is all right on fine winter days, when the screens may be opened at will. But on cloudy and stormy days, or cold and sunless, and during the nights, when the screens are closed, there is not sufficient ventilation going on through the cotton screens and the dampness, which invariably results from such conditions, is accompanied by an offensive odour, making the poultry house unhealthy.

To my mind, this is the only serious objection to the modern cotton-

front poultry house. As to the prejudices which many people entertain against this kind of house, they are not based on sufficient reasons.

To overcome these difficulties was the object of my experiments during the last two years. These experiments were not undertaken with a view to doing away with the cotton-front poultry house, but to improve it, to modify it in such a way that the ventilation might be good and sufficient, in spite of the inclemencies of the weather.

In 1914, I had a house of 200 hens in which the temperature was not satisfactory, in spite of the fact that two-thirds of the front of the house were in cotton and the remaining third in glass. What was I to do? It was too late and it would have been too expensive to put in a straw loft to improve the ventilation. I then put in a regular ventilator with an inlet at the bottom and an outlet at the top, thus correcting the insufficiency of ventilation through the cotton screens, which left much to be desired.

The results were conclusive. During the winter of 1915 and 1916, the inside temperature remained quite dry and healthy at all times. Farmers who were in the same conditions made the same improvement and obtained the same results. This combination appears to be useful and even necessary if one wishes to have, at all times, a good and healthy temperature. It is clear that both systems complete each other; the fact is amply proved by experience.

This system of ventilation has been adapted to all our poultry houses, the construction of which is thus modified as follows (the following figures are based on a house for fifty hens):

Dimension, 15 x 15 feet; height in front, 8 feet; behind, 6 feet.

This building is laid on posts, one foot from the ground.

In the centre of the front, there are glazed sashes 6 feet x 4 feet with

cotton frames on each side, of the same size. These sashes are two feet from the floor. On the west side, northern corner, there is a glazed sash of 5 x 4 feet. All the walls of this poultry house are in T. and G. boards as well as the roof, which has building paper in addition. The north and east corners have a double thickness of T. and G. boards with paper and air space on a length of 7 feet; this is the night pen. There are also two ply of boards in the floor, with paper between. In the floor in the centre of the house there is an opening of 6 x 6 inches, which is covered with a box two feet high with an opening that is fitted with a sliding door, which may be opened or closed at will. Above the glazed sash, in the front of the house, between the roof and the plate, there is an opening 6 inches wide and one foot long, covered with a wire mesh. This ventilating system presents no objections it costs only a few cents, and has the tremendous advantage of keeping the poultry house well ventilated and always dry and healthy.

This experiment was carried a little further. Many people are still prejudiced against the modern poultry house, with a large cotton front, and these prejudices, strengthened by the failure of some of these houses, are difficult to eradicate.

I tried this new system on a house containing one hundred and fifty hens, with fifty per cent. of the front in cotton and the rest in glass. The result was conclusive; not the least trace of dampness, inside temperature dry and healthy at all times.

My object is attained and I think I have perfected the cotton ventilation system, which, when used alone, does not always work well. It is well known that in some moist sections of the province, as the Lower St. Lawrence and other localities surrounded by large bodies of water, the use of cotton-front poultry houses is not to be recommended, as these houses are not sufficiently protected

against dampness. However, with a ventilation system independent from the cotton ventilation one may have in these districts houses that are quite healthful.

I am quite satisfied, that one may, by this system, keep a dry

and healthful temperature in poultry houses, even in the winter.

If this system of additional ventilation is adopted, one must, as I said before, enlarge the cotton front to make it at least two-thirds of the front of the house.

THE MANITOBA AGRICULTURAL COLLEGE

BY M. C. HERNER, PROFESSOR OF POULTRY HUSBANDRY

IN connection with the ventilation of poultry houses in this province, we have found the use of the curtain on the south side and the straw loft with the slatted ceiling to be the most satisfactory method of ventilating a poultry house. The gable roof house has given better satisfaction than the shed roof and we recommend the former for Western conditions. The volume of air in the house in proportion to the surface exposed to outside weather conditions is greater than that in the shed roof house, and besides in these gable roof, straw loft poultry houses there are practically two distinct volumes of air, that is, the one below the ceiling in the pens and that above the ceiling in the loft. We use about two feet of straw on the slatted ceiling. The slats should be four inches wide and may be placed from four to six inches apart. With two feet of straw on top of this ceiling there is a gradual interchange of air going on, and in addition to this interchange of air, the straw helps to absorb the moisture. In our long house we have a ventilator sixteen inches in diameter coming through the peak of the roof about a foot and entirely open at the bottom. In the winter time we put a bran bag over this opening to prevent too rapid a circulation of air, but in the summer time this is open entirely, and gives us almost ideal ventilation. In place of this ventilator for a house 30 feet long and 14 feet wide we

recommend openings about a foot square in the peak of each of the gable ends of the house, and a curtain frame fitted into this. This system works out to good advantage in the winter season, and in the summer the frames can be taken out entirely.

A house for fifty hens can be built on a similar plan, making it probably only twelve feet wide and twenty feet long, with the same system of curtain on the south side and the same type of ceiling. We find that a shed roof house is inclined to be damp and too cold in the winter time and also too hot in the summer time. This is not the case with the gable roof, straw loft house. The arrangement in the south side is four by four curtains and the same sized windows placed alternately the entire length of the house. The windows are stationary, and the curtains are hinged at the top and swing inwards and upwards. The curtains are opened up on bright sunny days, if the temperature is not lower than zero, or a little lower probably. We like to have the curtains open during such days for an hour or so at the time when the sun is warmest. By this method of ventilation, we keep the temperature in the house almost uniform throughout the twenty-four hours. We recommend about one square foot of curtain for every square foot of floor space and also the same amount of glass for the same area of floor space.

We recommend houses from twelve

to sixteen feet wide, but prefer a fourteen foot house and the height from the sill to the plate to be six feet clear. The windows and curtain frames are placed about eighteen inches from the sill, thus bringing them within six inches of the plate. We guard against running down the eve trough too far to obstruct the sunlight from shining in the pens through the windows and curtain openings.

The length of the house will depend, of course, upon the number of hens in the flock. We allow from four to six square feet of floor space for each bird. I think a house for fifty hens should not be more than fourteen feet. I consider sixteen feet almost too wide for our Western conditions in that the house is inclined to be somewhat dark during the short winter days, if it is too wide. We have a solid partition every twenty feet in order to break any draught that might occur by opening the curtains at each end at one time.

In connection with the walls of the house we recommend four-inch studding in order to get a dead air space. On the inside we prefer one thickness of building paper and tongued and grooved lumber nailed on the studding on top of this paper. On the outside ordinary siding would be quite satisfactory unless the poultry house is very exposed, when we recommend one thickness of building paper on the outside of the studding, as well, and the siding nailed on top of this. The south side does not require this extra thickness of paper. I believe in fresh air and lots of it.

In order to provide comfortable

roosting quarters we have a drop curtain coming down in front of the roosts at night time whenever the temperature goes lower than 10 below zero outside. These roosting chambers are ventilated through the straw in the loft, and also through a small opening between the joists at each end of the chamber.

While the shed roof is considerably cheaper than the gable roof house here described, still for an all round satisfactory house for this country we cannot recommend the shed roof house as being equal to gable roof for the reason aforementioned. I do not think that there is any system of ventilation that can be installed in a poultry house that will be as satisfactory as the one described for the gable roof house. The idea is to prevent the house from heating up during the day time. This can be done by having the ventilation system as here described. In the shed roof house there is a tendency for the house to be warmed up during the day time, and the moisture holding powers becoming increased considerably. At night time the air cools off, the water holding capacity decreases, and, of necessity, the moisture will congeal on the walls and on the litter on the floor, thus causing what is claimed as a damp, cold poultry house, and one which is entirely unsatisfactory for this climate.

We have not done any experimental work, or any special investigation work in connection with ventilation, except what observations we have made in comparing these two types of houses in our every day poultry work, the results of which are as above outlined.

SEED FAIRS

The seed fair has, within the past few years, come to be recognized as an important factor in crop production in Canada. The following symposium, contributed by the responsible officials in the various provinces, outlines its beginning, its purposes, its development and results:

PRINCE EDWARD ISLAND

BY THEODORE ROSS, B.A., SECRETARY FOR AGRICULTURE

S EED fairs in Prince Edward Island had their beginning in 1903.

During the visits of Mr. G. H. Clark, now Dominion Seed Commissioner, to the province in connection with the Macdonald Seed Grain Competition, his attention was attracted to the superior quality of the oats. He was of the opinion that Prince Edward Island ought to grow its own seed oats, instead of importing them, and that oats offered for export should be properly cleaned and graded, and sold for seed rather than for feed.

Shortly after receiving his appointment as Chief of the Seed Branch he took this matter up with the Provincial Department of Agriculture, with the result that the Provincial Seed Fair was inaugurated, the Provincial Department engaging to contribute the money to pay the prizes.

For the first four years progress was slow, the total number of entries in 1906 being under one hundred, and the attendance of visitors less.

In 1907 at the request of the Prince County Institute, the fair was held in Summerside. They contributed upwards of \$200 to the prize list and every Farmers' Institute, not only in Prince county, but in the whole province, felt responsible for its success.

The official report states that the attendance was over 1500, 226 en-

tries being received and 134 prizes awarded.

From this time the fair grew very rapidly. In 1908 there were 625 entries. In 1909 a department of Household Science was added, and the total number of entries was 992 and in 1910, 1026. In 1911, a Handicrafts Department was added, and the total number of entries was 1448, of which 873 were in the Seed Department.

The number of visitors also grew in like proportion. Educational meetings were held in connection with the fair, which were addressed by the best men available, and the difficulties that faced the committee in charge every year were to secure suitable buildings for the holding of the fair, and to provide accommodation in the town for the visitors.

The official report for 1911 contained the following:

"The grains and other seeds were exhibited in the Andrews' Building, and the cookery and handicrafts in St. Paul's Hall. The educational meetings were held in the Market Hall and in St. Columbus Hall, in both of which standing room was at a premium at nearly all the meetings. Your committee would recommend that the fair be held for four days in 1912, to give ample opportunity for looking over the exhibits and for the holding of classes in seed judging in addition to the regular courses of lectures. We believe that no other similar institution has contributed more to the development of agriculture in this province than the Provincial Seed Fair."

In the autumn of 1909, the class for grain was omitted from the

King's County Exhibition and a seed fair held the following spring. It was satisfactory in every respect. The number of entries was three hundred and the attendance was large. Educational meetings were held in connection with it morning, afternoon and evening. In 1910 the poultry class was also omitted from the autumn exhibition and held the following spring in connection with the seed fair. Since then the King's County Seed Fair and Poultry Show has been an annual institution, and is making satisfactory development.

In 1911, the Central Seed Fair, open to the whole province, was established at Charlottetown. It too, contained a Household Science Department, in which there were 445 entries, the total entries for the year being 931 and for the following year 1173.

In 1913 seed fairs were also established at Souris and at Murray River, the number of entries at the former being 189, and at the latter 91. The former added a poultry show the following year and in 1915 the total number of entries was 390.

The fair at Murray River is making excellent progress, the number of entries in 1915 being 133.

MANAGEMENT AND DEVELOPMENT

According to arrangements made between the Seed Branch and the Provincial Department the former was to provide judges and expenses of management. In 1905, the advertising and later the general management was handed over to the Provincial Department of Agriculture and an allowance made by the Seed Division for the same.

In 1912 the Seed Branch turned over the complete management of the fairs, including the judging, to the Provincial Department, and in lieu thereof paid subventions about equal to half the total expenditure, with a maximum grant for each fair.

There has been development, too,

in the making up of the prize list. Up to 1910, sections were added as new varieties made their appearance, and in that year at the provincial fair there were four sections for wheat, eight for oats, and seven for potatoes. Since that time an attempt has been made to eliminate the less desirable varieties and at the 1916 fair competition in oats was limited to Banner or Danish oats, Old Island Black or Black Beauty, and to any other named variety.

Similar progress has been made at the other fairs.

From its inception the Central Seed Fair made two classes for grains, one for hand picked, and one for machine cleaned. Prizes were also awarded for grain in the sheaf. Since 1915 the provincial fair has made three classes: class A. open only to members and applicants of the C.S.G.A., class B. open to exhibitors in fields of standing grain competition not eligible for competition in class A; and class C. open to all not eligible for class A or B.

SEED SALES INTRODUCED

In announcing the establishment of the Provincial Seed Fair, the Seed Commissioner stated its chief object to be the establishing of a market for high class seeds, and a clause was inserted in the rules and regulations requiring an exhibitor to have a certain amount for sale of the same quality as that which was being exhibited. In 1908 and 1909 the committee undertook to make sales in accordance with this regulation, but the results were not satisfactory, and in the following year the first prizes were increased to include the price of the grain, which became the property of the committee, and was sold by public auction on the last day of the fair. This feature has proved so satisfactory that it has been extended to all the prize exhibits and is now being adopted by some of the other fairs.

That the quality of the exhibits should be very much improved is what would be expected. Everyone knows that it is useless to show seed now at any of the fairs that is not free from weed seeds and well graded.

But not only has the quality of exhibits at the seed fairs improved, but the seed fairs and the educational meetings held in connection therewith have had a marked influence on almost the whole of the seed used in the province.

At the time the seed fairs were established there was imported an-

nually from 15 to 20 thousand bushels of seed grain and practically none exported. Now the exports of seed oats alone exceed two hundred thousand bushels per annum, and practically none are imported.

There has been a marked increase in the yield per acre of grain in this province during the past decade, and much of it is, no doubt, due to the good seed movement inaugurated by the Seed Fairs and educational meetings held in connection therewith, and strengthened and developed by the fields of standing grain competitions.

NOVA SCOTIA

BY M. CUMMING, B.A., B.S.A., SECRETARY FOR AGRICULTURE

EVER since exhibitions were organized in Nova Scotia, as far as I can determine, there have been classes for the exhibit of seeds of various kinds. Incidentally it is interesting to note that there is a record of an agricultural society in Windsor, N.S. which held a fair on May 21st, 1765.

At these exhibitions, however, prizes were given not so much from the standpoint of the perpetuation of good varieties, but simply from the standpoint of the exhibit of the product of the fields of the previous year.

The seed fairs as carried on at present were instituted first in the province, so far as I have been able to determine, in the year 1905, when small seed fairs were held at the time of the opening of the college at Truro, and at Berwick in Kings county. These fairs were the result of the combined efforts of Dr. James W. Robertson, who a year or two previous had inaugurated the Macdonald-Robertson Seed Grain Competition, and of Mr. George Clark, who had shortly before assumed the direction of what was to be the Seed Branch of the Federal Department

of Agriculture. The exhibits at these fairs were not large, but they formed the basis for a future development, which has proved invaluable to the farmers of the province of Nova Scotia.

LOCAL AND PROVINCIAL FAIRS

Local seed fairs were held during the winter of 1915-16 at five centres in the province. In addition to this there was a provincial seed fair at Truro, and an inter-provincial seed fair at Amherst in connection with the winter fair, making in all seven seed fairs in the province. These seed fairs were held for the most part under the auspices of the local agricultural society or county farmers' association. They received grants as follows: From the Seed Branch, Federal Department of Agriculture, two-thirds of prize money paid out, not in any case to exceed \$50, and from the Provincial Department of Agriculture, one half of the prize money paid out when this amounts to \$100 or less, three-fifths when it amounts to \$101 up to \$120, and two-thirds when it amounts to \$121 and over. The ordinary local seed fair pays out about \$100 in

prize money, and on this basis receives from the Federal Department of Agriculture \$50 of this amount, and from the Provincial Department another \$50. The expenses of the agricultural society or association are, therefore, simply those involved in advertising and in securing the hall. Judges are sent by the Provincial Department of Agriculture, usually accompanied by a representative of the Seed Branch of the Federal Department of Agriculture, and no charge is made to the society or association for their services.

The provincial seed fair at Truro receives a grant of two-thirds of the prize money paid out, not in any case to exceed \$400, from the Seed Branch of the Federal Department of Agriculture. The balance is paid by way of grant from the Provincial Department of Agriculture.

In passing, a point worthy of strong commendation is the co-operation of the Federal and Provincial Departments in this work. This has been responsible for a large amount of the success which has attended the whole seed improvement movement in the province, for it has removed the seed fair and other agencies relating to seed improvement from the sphere of political and other criticism, which has proven a decided advantage in the whole movement.

THE GOOD THAT IS BEING DONE

It is impossible to consider seed fairs apart from the work of the field crop competitions and from the Canadian Seed Growers' Association. These are all part of one general movement for the improvement of the crops in the province, a movement which is accumulating force in each year and is leading to splendid results. Prior to the organization of this whole movement, only a decade ago, few farmers in the province ever thought of using their own home grown seed, and even those who purchased were not by any

means as particular as they should have been in regard to the quality of seed which they secured. The result was in many cases in different varieties of crops and the over-running of the fields of the province with pernicious weeds. This practice is still far too common, but the seed fair and the field crop competition, and the growing or registered grain by members of the Canadian Seed Growers' Association are all gradually leading to the suppression of this practice, which has had such ill-effects on the farming of the province.

As to the effect on production, the records of recent field crop competitions in the county of Antigonish, where one of the best seed fairs in the province is annually held, show that every prize winner in the oats competition secured his seed from one source, *i.e.* a member of the Canadian Seed Growers' Association, who first of all showed the superiority of his seed by prizes won at the seed fair, and then by the results in the actual field tests. Out of this has come a demand for seed from that part of the county far in excess of the supply. In fact the great bulk of the supply is being taken up by people living in the neighbourhood, and if the movement continues to gain strength as it has it will only be a short time until the whole county is famed as a source of supply for purchasers of oats, wheat and other seeds.

ONE OF THE DIFFICULTIES

The principal difficulty which the writer sees in connection with the seed fairs is the one which is confronted at exhibitions of all kinds, *i.e.*, that after a time the leading men of the community get so skilled in their work that there seems to be little chance for the average farmer to "break in". At least, he is discouraged in his efforts to do so and consequently the history of these seed fairs is that the number of

exhibitors does not grow as one would like. The character of the exhibit has improved tremendously, and the value of the fair from the standpoint of education, and as a source to others of high class seed has grown equally, but as a big exhibit participated in by the rank and file of farmers one could not pronounce these seed fairs an unqualified success. Perhaps this cannot be brought about, for it may be that in this as well as in other realms of life, the leaders quickly come to the top and are bound to maintain their supremacy over their average fellowmen. In any case I have thought it worth while to outline this problem and may receive suggestions as to its solution from others who read the story.

The difficulty is not so serious in connection with the Provincial Seed Fair, for at such a fair one naturally expects that all the leaders from the various sections of the province will exhibit, and since the area is large

there is bound to be a large number of exhibitors every year, but the difficulty is a real one in the smaller local fairs, where everybody knows everybody, and where accordingly this continued securing of prizes by a certain few brings about results which we have discussed in the foregoing.

The seed fair movement, the field crop competition movement, and the Canadian Seed Growers' movement have been worth thousands of dollars to the province of Nova Scotia. A great feature in connection with them is that they afford scope for the farmer of small as well as large means, provided he has the ability and desire to carry on his work. In live stock breeding centres the wealthy man has a big advantage over his poorer neighbour, but the seed work lends itself to all, and in its own quiet way is exerting an influence on the average farmer of the province, the value of which is difficult to over-estimate.

QUEBEC

BY HAD. NAGANT, DIRECTOR OF THE JOURNAL OF AGRICULTURE

AMONG the methods which have been recommended for a long time as likely to improve our agriculture, the improvement of seeds, and the maintenance of those seeds at a high degree of purity and productivity, was one which, more than any other, attracted the attention of agriculturists and of the Government. Several methods were urged for this purpose, such as the use of samples of grain distributed by the Ottawa Experimental Farm, standing crops competitions, the purchase of good seed by the various agricultural associations, the organization of seed growers' co-operative associations, and, specially, in order to recognize the work of good farmers and make it known throughout the country,

the official organization of seed competitions.

Before this organization was established regularly in 1911 endeavours were made in the same direction in 1903 by the Eastern Townships Agricultural Association and by the Sherbrooke County Agricultural Association and also in 1905 by the St. Hyacinthe Agricultural Association.

IN QUEBEC CITY

Since 1911 a great winter seed fair has been held every year in Quebec city. Advantage is taken of this fair to give a series of lectures and information on matters pertaining to the production of choice seed and the improvement of agricultural production. In addition, the agri-

cultural associations are asked to organize fairs and competitions with prizes in their respective counties.

The exhibits are judged at these fairs by competent experts, supplied by the Dominion Department of Agriculture, by the provincial Department of Agriculture, and by Macdonald College, and they state the reasons for their decisions.

BY THE AGRICULTURAL ASSOCIATIONS

In 1911, seed grain fairs had been held only by seven agricultural associations and the sum of \$350 had

ANNUAL PROVINCIAL FAIR

For the last six years, a provincial seed grain fair has been held annually at Quebec, generally at the end of January. The number of farmers or purchasers of good seed attending this fair is yearly increasing. The following figures speak for themselves:—

YEAR	Number of Entries	Paid in Prizes
1911.....	275	\$364.00
1912.....	325	581.00
1913.....	400	588.00
1914.....	429	661.00
1915.....	540	828.00
1916.....	700	911.00



EXHIBIT OF CLOVER SEED AND GRAIN IN SHEAF SELECTED BY CHILDREN

been distributed in prizes to the farmers.

In 1912 the amount paid in prizes was \$542. In 1913 this amount was increased to \$862. In 1914, 23 associations distributed \$1,678 in prizes. In 1915 there were 32 fairs of this kind with a list of prizes amounting to \$2,334.25. In 1916 the amount paid in prizes by 39 associations was \$2,900. As shown by these figures, there has been considerable progress and the movement will go on developing.

These provincial fairs are held under the auspices of the Quebec Department of Agriculture, with the help and co-operation of the Dominion Department of Agriculture. They generally last a couple of days, during which the seed grains are sold or exchanged.

JANUARY FAIR, 1916

This year again, material improvement was noted in the number, the quality and the purity of the exhibits. The following is a summary

of the programme which was followed for this competition:—

WEDNESDAY, JANUARY 26TH, 1916

9 A.M. to 6 P.M.—Grain judging; Judges: Messrs. James Murray, professor, Macdonald College; J. A. Simard, seed grain inspector, Ottawa, and Louis Lavallee, agriculturist, St. Guillaume of Upton, Yamaska.

THURSDAY, JANUARY 27TH, 1916

9 A.M.—Competition for seed grain judging, divided in two classes:—

Class 1: Competitors in this class must not be under 16 years of age or over 25 years of age. The following prizes are offered:—1st, \$8; 2nd, \$6; 3rd, 4; 4th, \$2; 5th, \$1.

Class 2: Including all farmers over 25 years of age (same prizes offered as for Class 1).



EXHIBIT OF GRAINS GROWN IN L'ABITIBI DISTRICT

8 P.M.—Convention of the members of the Canadian Seed Growers' Association, under the presidency of the Honourable the Minister of Agriculture of Quebec. All the farmers are invited to attend this convention. Lectures, followed by discussion, are given on the production and selection of seed grain, the growing of clover, etc.

10 A.M.—Auction sale of grain.

5 P.M.—Closing of fair.

The conditions and regulations governing the contests are explained to the competitors before the competitions are started by the judges for both classes.

ONTARIO

BY J. LOCKIE WILSON, SUPERINTENDENT OF AGRICULTURAL AND HORTICULTURAL SOCIETIES

UNDER the old Agriculture and Arts Act passed over 30 years ago there was no provision made for grants to seed fairs in Ontario, and few were held be-

tween 1882 and 1906, which latter date was the time of the passing of the new Act governing agricultural and horticultural societies, together with their fairs and exhibitions.

In recent years agricultural societies have been holding annual seed fairs, usually between January and April, which tended largely to the improvement and selection of seed grain and roots. At these fairs quantities of grain are sold by auction and otherwise to farmers who are desirous of improving their field crops, and, being held at a time of year when farmers are not so busy, there is generally a good attendance of those interested.

Judges are furnished by the Department of Agriculture without cost to the fair boards, who explain fully their reasons for the placing of the awards. After the judging is completed, addresses are given by qualified speakers and recommendations made as to the varieties of grain best suited to each locality, and farmers present at these meetings are encouraged to ask questions and take part in the discussions.

The following is a sample of the rules governing local seed fairs:

1. All seeds entered for competitions must have been grown by the exhibitor within one year previous to the exhibition.
2. Any seed exhibited in competition for prizes must be subject to the regulation that it will be offered by auction, at the close of the fair, for sale to the highest bidder.
3. A two-bushel sample of wheat, oats, barley and peas, or one bushel of corn, potatoes and grass and clover seeds shall be exhibited.
4. No premiums shall be awarded on exhibits that contain weed seeds which, in the opinion of the judge, are of a noxious nature.
5. No exhibitor shall receive more than one prize in any class.

6. All samples of seeds must be correctly labelled with the name and address of the exhibitor, the name of the variety, the amount of seed for sale, if any, and the selling price.

7. A sample of all grain exhibited will be retained by the society for comparison with seed afterwards sold by the exhibitor; this rule being for the protection of the buyers of seed grain.

The maximum legislative grant to these local fairs is \$25, and, in order to secure this, the sum of \$50 must be expended. They are frequently held in conjunction with spring stallion and bull shows, which receive separate grants.

Besides these local seed fairs, large prizes are offered for exhibits at the Eastern and Western seed fairs, usually held in connection with the winter fairs at Guelph and Ottawa, for which a sum not exceeding \$600 is offered in prizes. One-third of this amount is paid by the Ontario Government and two-thirds by the Dominion. The Canadian Seed Growers' Association and the Ontario Experimental Union exhibit and participate in this grant.

Besides the above, the directors of the Canadian National Exhibition offer the following prizes for sheaves and grain from the standing field crop competitions. Those eligible to compete are the first five prize winners. For these exhibits the province has been divided into three districts, and prizes are awarded to the competitors in each of the three divisions mentioned below:

PRIZES FOR SHEAVES

	Fall Wheat	Spring Wheat	White Oats	Barley
First prize	\$8 00	\$8 00	\$8 00	\$8 00
Second prize..	7 00	7 00	7 00	7 00
Third prize	6.00	6.00	6.00	6.00
Fourth prize..	4.00	4 00	4.00	4.00

Division 1, includes Muskoka, Parry Sound, Haliburton, Nipissing, Manitoulin, Algoma and districts in New Ontario.

Division 2, all counties east of

York and Simcoe.

Division 3, York, Simcoe, and all counties west and south-west of same.

Each sheaf must be not less than

eight inches in diameter, and carefully selected from the best grain in the field, neatly bound by hand, packed in a box, lumber in same not

to be more than three-quarters of an inch thick, and box to be not more than two inches longer, wider or deeper than sheaf.

PRIZES FOR TWO BUSHELS OF GRAIN

	Fall Wheat	Spring Wheat	White Oats	Barley	Peas
First prize.	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00
Second prize	9.00	9.00	9.00	9.00	9.00
Third prize	6.00	6.00	6.00	6.00	6.00
Fourth prize.	4.00	4.00	4.00	4.00	4.00

The Directors of the Central Canada Exhibition, Ottawa, also offer similar prizes, for which the same exhibitors as above are eligible.

The prize-winning grain at these larger fairs is retained by the Department for distribution to farmers in different parts of the province, for the encouragement of production of larger and better crops. Ontario seed fairs in the past have been the means of splendid educational work, and, as the years go by, interest in them is increasing and a greater

demand than ever before has arisen for pure seed grain, true to type and name, and farmers are beginning to realize the necessity of specializing and making their locality noted for the variety of grain that has given the best results to the tillers of the soil in their particular section.

SCORE CARD

The following score card is used for all kinds of grain exhibited at fairs and exhibitions:

PURITY	Possible Score	Judge's Score
(a) Free from weed seeds.	25	.....
(b) Free from other varieties or other kinds of grain	10	.....
(c) Free from smut	15	.....
QUALITY OF GRAIN		
(a) Grain sound—free from damage by must, frost, etc.	20	.....
(b) Grains uniformly large and plump (oats with thin hull); 5 points deducted for each lb. under standard weight	25	.....
(c) Colour.	5	.....
Total	100	.....

SCORE CARD FOR SEED WHEAT

I. PURITY, 50 PER CENT POINTS	Possible Score	Judge's Score
(a) Free from noxious impurities, determine kinds of weed seeds, if any, and proportion of them in the sample.	20	.....
(b) Free from impurities, as other kinds of grain, broken grain, chaff, etc.	7	.....
(c) Purity as to variety. The grains should be uniformly true to the type characteristic of the variety examined.	13	.....
(d) Absence of smut. The appearance of smut balls and smut on the grain should cause wheat to be rejected for seed.	10	.....

II. QUALITY OF GRAIN, 50 PER CENT OF POINTS	Possible Score	Judge's Score
(a) Grain sound, free from damage by must, frost, etc., and apparently of strong vitality.	10	.....
(b) Grains uniformly plump and relatively large for the variety. Five points may be deducted for each pound under standard weight.	18	.....
(c) Grain of good milling value, considering the purpose for which it is intended. Translucent grains indicate a high percent of gluten and a capacity for producing a large quantity of strong patent flour, suitable for bread-making. Opaque grains of a soft starchy appearance indicate a deficiency in gluten. Such wheats produce a flour more suitable for biscuits or pastry	14	.....
(d) Colour bright and clear, indicating well ripened grain not weathered	8	.....
Total	100	.

SCORE CARD FOR POTATOES AT FAIRS AND EXHIBITIONS

	Possible Score	Judge's Score
1. Purity of variety	10	.....
2. Size and uniformity	20	.....
3. Shape and smoothness	20	.....
4. Colour	10	.....
5. Freedom from disease and insects	15	.....
6. Quality	25	.....
Total.	100	

SCORE CARD FOR ROOTS AT FAIRS AND EXHIBITIONS

	Possible Score	Judge's Score
1. True to type	15	.....
2. Colour.	10	.....
3. Size and uniformity	15	.....
4. Neck and crown	15	.....
5. Pronginess.	10	.....
6. Dimples and smoothness	10	.....
INTERNAL APPEARANCE		
1. Texture and quality.	25	.....
Total.	100	

SASKATCHEWAN

BY S. E. GREENWAY, B.S.A., DIRECTOR OF AGRICULTURAL EXTENSION WORK, UNIVERSITY OF SASKATCHEWAN

THE first seed fairs were held in the province of Saskatchewan in 1906. Each winter since that time has seen the competition grow in popularity and importance as an educational feature of agricultural society work. These activities as indicated in the annual reports of the Department of Agriculture, were held as follows: 1906, 20; 1907, 35; 1908, 37; 1909, 49; 1910, 62; 1911, 34; 1912, 50; 1913, 55; 1914, 35; 1915, 90. It will be noted from the above figures that the comparatively steady growth was broken in 1911 and 1914, the former season being handicapped with early and incessant blizzards and the latter the year of the great drought. The great crop year, 1915, saw the greatest advance in the growth of the seed fairs.

THE SCOPE OF THE FAIR

The aim in encouraging the seed fair has been to further the production of clean seed of strong vitality and of character suitable to local conditions. The province of Saskatchewan presents most varied features both in respect to types of soil and amount of rainfall, demanding different methods of tillage, and the adoption of cereals having regard especially to earliness of maturity, where frost is the limiting factor, and a full understanding of tillage, where the lack of rainfall is the limiting factor. Closely associated with the use of cereals is the development of live stock. In a general way the Department of Agricultural Extension of the University of Saskatchewan, which has charge of the seed fair work, has endeavoured to make use of the seed fairs to encourage development in both branches. To this end an expert in field husbandry and one in animal husbandry are supplied free

of cost to the organizations desiring to conduct seed fairs. Where the services of the staff can be fully made use of two days are given to the work during which time live stock and field husbandry matters are dealt with quite extensively, and usually a separate session is devoted to the local school pupils. In this way much valuable instruction is given in the two most important branches of agriculture where the best use can be made of it. This feature of the seed fair has fostered the growth of the school fair, which has developed in the last two years in a phenomenal manner. In 1914, only 8 school fairs were held. Last year this number grew to approximately 50, and this year it is expected there will be at least 300 school fairs in the province, at which seed and live stock judging competitions will be prominent features.

EXHIBITS AND SPECIAL FEATURES

The exhibits at the seed fairs include the cereals, grasses and root crops as a general rule. Very often where the Homemakers are organized they co-operate in the undertaking and offer prizes for butter, eggs, dressed poultry, cookery and other household manufactures. Many of these fairs are highly entertaining and instructive, ending with a grand banquet and entertainment patronized by the whole countryside. This attractive social feature once adopted in a locality is rarely discarded. In addition to the features noted, twenty-five organizations conducted live poultry shows. The poultry industry is developing so rapidly that an enormous number of entries are provided. Not infrequently from 300 to 1,000 birds are on hand to receive awards. These birds are invariably pure-breds of the utility

breeds. Where poultry shows are held, additional judges are supplied free of cost, to handle the entries in these sections.

BENEFITS AND RESULTS

It is noted by the judges employed, all of whom have had the benefit of three short schools to fit them for the work, that no activity shows such immediate results. It is a remarkable fact that even in colder communities where the interest has not been centered in progressive work of the kind, nearly every entry of the twenty or thirty shown at the first seed fair contained disqualifying impurities. Betterment always results quickly and it is in such localities that the permanence of the seed fair is assured. The same results accompany the exhibiting of any other classes of agricultural produce. The benefit of the seed fair over the annual exhibition lies in the fact that qualified judges, in addition to scoring the exhibits with a standard of perfection, are enabled to take up the results, point by point, with the exhibitors. It should not be overlooked that judging competitions in both cereals and live stock are provided at most of the seed fairs.

It is quite impossible to gauge the

benefit derived from this desirable activity, but judging from the interest taken in the work by all classes the betterment in the provincial crop production must be very great.

Many individual instances might be quoted of success following the adoption of suggestions thrown out by the speakers provided for the work of seed fairs. There are so many factors entering into the production of crops, each of which is important in itself, that the topic is of absorbing interest once the attention of the farmer is directed to the many-sidedness of it. The time of ploughing, harrowing, or packing, the dates and rates of seeding, cultivation subsequently to seeding, as well as the choice and preparation of seed, viewed in the light of varying conditions of soil and climate, give rise to infinite uncertainties.

A visitor and exhibitor at one of our seed fairs remarked last fall that he had adhered to the principle of heavy seeding on light land for 25 years, only to discard it on learning that modern scientific practice showed the wisdom of lighter seeding under his conditions. He added that his success with the newly adopted principle was quite phenomenal. It is this demonstration of important details which counts.

ALBERTA

BY J. MCCAIG, EDITOR OF PUBLICATIONS

SINCE the inauguration of the province, seed fairs have been held every year. In the first year ten fairs were held. By the year 1914, the number had increased to forty-one. The improvement in the use and quality of the seed fairs has been still greater than the improvement in numbers. Some of the weaker fairs have been discontinued, while others have grown in membership, patronage and efficiency. In estimating the work

of seed improvement it is well to note the other agencies which have been doing the same kind of work in other ways. These are the short course schools, special demonstration trains and field crop competitions. As early as 1907, the Provincial Department of Agriculture in conjunction with the Dominion Department operated a seed train for two and a half months, and gave full day courses in practically every town in the province.

AIMS AND SOURCES OF ENCOURAGEMENT

The general aim of the Department is to promote the production of more and better grain both for the sake of the individual farmer and for greater total national production. The seed fair itself has two important aims—education and business. At each of the seed fairs, lectures are delivered on the constructive processes in agriculture such as thorough cultivation, moisture conservation, conservation of fertility, summer-fallow, relation between live stock husbandry and clean seed, as well as on weed eradication, grain judging and grading, care of the crop, handling, threshing, etc. In the second place, the fair is made the channel for the transaction of profitable business for both the producer of special seed and the farmer who is looking for good seed. For this purpose, the Department issues a bulletin advertising the supplies of good grain available in the province. In addition to the names of the winners at the seed fairs, it gives the names of the winners in the field grain competitions. These bulletins are sent in answer to all enquiries for seed grain and many are distributed in other ways.

CHANGES IN POLICY

The chief feature of change in the policy of the Department is in the direction of expansion in the prize lists to include not only the standard cereals, but also all kinds of other farm seeds such as flax, corn, the

grass seeds—brome, rye and timothy, alfalfa and the clovers—and also the greatest possible variety of forage possible within the adaptabilities of the province. Field roots and potatoes are regularly exhibited. The recent success of Alberta timothy seed in Eastern markets will justify the fullest encouragement by the Department of special farm enterprises for timothy and other grass seed culture, in addition to the considerable business already established in the production of seed wheat and oats.

DEPARTMENTAL ASSISTANCE

The Department at present supplies judges free of cost, pays for the printing of prize lists and dodgers, and pays a grant of dollar for dollar up to \$100 of the amount actually paid out in prize money. Judging is by score-card and the judge is required to leave the results of his scoring on a card with each exhibit for the information of the exhibitors.

There is no doubt that the quality of grain is improving. The educational work of the fairs, the short course schools, grain judging schools, field grain competitions and the work of the Weed Branch have all operated to make the quality of our grain better than it was six or eight years ago. In the spring of 1915 the Dominion Government secured about 3,000,000 bushels of Alberta grain for distribution for seed. Good seed in large quantities is now available, whereas six or seven years ago it was scarce.

BRITISH COLUMBIA

BY H. O. ENGLISH, B.S.A., CHIEF SOIL AND CROP INSTRUCTOR

WITH the development of the mixed farming industry of this province during the past five years came a demand on the part of the farmers for better seed. For a few years it was easy to secure

seed from outside sources to satisfy this demand, until in 1914 the general scarcity of first class seed throughout the Dominion made itself felt in this province. Coupled with this came a realization that too many weed pests

were securing entrance to the province with the seed imported. About the same time an appeal was sent out from the Dominion Department of Agriculture calling upon all farmers to put forth an effort to grow their own vegetable and root seed. Taking everything into consideration, the Provincial Department of Agriculture decided that the inauguration of a system of seed fairs would be the most effective way to encourage the farmers in all parts of the province to go into the business of producing seed, if only on a small scale.

FIRST SEED FAIRS AND REGULATIONS

Provision was made in 1915 for the holding of two provincial and eight local seed fairs, the size of the province and the scarcity of transportation facilities making it seem advisable that the province be divided into two districts in each of which a provincial seed fair should be held. A fund was set aside to provide for grants toward the prize money of the eight local seed fairs, each local seed fair to be conducted by a Farmers' Institute.

The provincial seed fairs were to be conducted under the auspices of the Department of Agriculture and the prize money paid out of the funds of the Department. The local seed fairs were to be held under the auspices of Farmers' Institutes, any Farmers' Institute electing to hold a seed fair to be entitled to a grant of \$75 from the Department. No provision was made for special prizes to be awarded for registered seed since there were no members of the Canadian Seed Growers' Association operating in the province. Departmental officials draw up the prize list, of which a copy is appended.

The first seed fairs were held during the winter of 1915-16. The provincial seed fairs were held at Armstrong and New Westminster during January. Although considerable interest was evinced, unprecedented

cold weather prevented many prospective exhibitors from sending their exhibits. As was to be expected, the quality of the exhibits was mediocre, inexperience in the matter of preparing the samples for exhibition being the chief reason for the lack of commendable.

Only one Institute elected to conduct a local seed fair. The Rosehill Farmers' Institute held a seed fair at Beresford, Kamloops, February 16th, 1916, which was a credit to the community. In number of entries, the fair was an unqualified success while the quality of the exhibits was fair.

The score card system of judging was followed at all fairs. This system proves very effective and is of additional value in that the exhibitor can see for himself just where his exhibit is lacking.

Our plans for the coming year are somewhat more elaborate. We are planning to hold the seed fairs during November and December, the local seed fairs to be held before the provincial fairs to enable the winners at the local fairs to come together at the provincial seed fair. In addition we are offering a somewhat revised list of prizes. Appended is a copy of the revised prize list, together with rules and regulations governing the seed fairs.

Already we can see evidence of the value of seed competitions in the better methods adopted by a large number of our farmers in an effort to produce better exhibits for this year's seed fairs. It is, however, impossible for us to state as yet just how greatly the seed fairs will influence crop production.

PRIZE LIST AND REGULATIONS

The following is the prize list to be used at the Provincial Seed Fairs which will be held at New Westminster and Armstrong during December, 1916, and governing regulations:

Class	NATURE OF EXHIBIT	1st	2nd	3rd
1	Best bushel registered spring wheat	\$15	\$12	\$10
2	" " " white oats	15	12	10
3	" " " seed-potatoes	15	12	10
4	" " spring wheat for seed	10	8	5
5	" " winter wheat for seed	10	8	5
6	" " white oats for seed	10	8	5
7	" " six-rowed barley for seed	10	8	5
8	" " peas for seed	10	8	5
9	" " potatoes for seed	10	8	5
10	" 20 lb. potatoes grown by a competitor in Boys' and Girls' Competition	10	8	5
11	" 12 ears fodder corn	10	8	5
12	" 12 ears seed-corn grown by a competitor in a Boys' and Girls' Competition	10	8	5
13	" 20 lb. of alfalfa-seed	10	8	5
14	" " alsike-seed	10	8	5
15	" " red-clover seed	10	8	5
16	" " timothy-seed	10	8	5
17	" 10 lb. of mangel-seed	10	8	5
18	" " turnip-seed	10	8	5
19	" " carrot-seed	10	8	5

All exhibits must be grown by the exhibitor in 1916. The Department of Agriculture reserves the right to take samples of all seed exhibited.

The Department of Agriculture will pay all transportation charges on seed shipped to the Seed Fair.

Exhibits will be returned to exhibitors upon request at their own expense.

REGULATIONS GOVERNING LOCAL SEED FAIRS

1. Provision has been made by the Provincial Department of Agriculture, assisted by the Dominion Seed Branch, for the holding of eight (but not more than eight) local seed fairs during the season of 1916-17.

2. Farmers' Institutes desiring to hold a seed fair must notify the Soil and Crop Instructor, Live Stock Branch, Department of Agriculture, Victoria, not later than September 1st, 1916. Farmers' Institutes making application must guarantee at least twenty entries, but the Department reserves the right to approve or reject any application. Fairs may be held during the months of December, January, and February only.

3. Each Farmers' Institute holding a seed fair will be entitled to a grant of \$50 from the Department of Agriculture. The Department will also supply judges, but all other expenses, including advertising, rental, and heating of hall, etc., must be borne by the Institute holding the fair.

4. The two following classes must be included in each prize list:—

- (a) A first, second, and third prize of at least \$5, \$3, and \$2, respectively, must be offered for exhibits from the plots entered in the provincial boys' and girls' competitions. This prize is open for competition only for boys and girls resident within the boundary of the Institute holding the fair.
- (b) A first, second, and third prize of at least \$5, \$3, and \$2, respectively, for the best exhibit from a plot of any one kind of crop entered in the provincial field-crop competition. Open only to members of the Institute holding the seed fair.

5. The prize-list must be submitted to the Soil and Crop Division for approval before being advertised.

THE CANADIAN SEED GROWERS' ASSOCIATION

BY L. H. NEWMAN, B.S.A., SECRETARY

THE Canadian Seed Growers' Association does not now hold seed fairs directly but it co-operates in various ways with the Provincial Departments in connection with fairs which they hold. Formerly, prizes were paid directly by the Association, but now the prizes are paid almost entirely by the provinces concerned. Most of the provinces hold what is known as provincial seed fairs at which prizes are

offered. Part of the money for these comes from the Dominion Government through the Seed Branch. In granting this money the seed Branch requires that a certain proportion be offered for prizes for registered seed. This rule is very willingly complied with by each province as all recognize the value of registered seed and desire to encourage its production and extension as much as possible.

ADVERTISING CANADIAN FRUIT

ONTARIO

BY P. W. HODGETTS, DIRECTOR FRUIT BRANCH

NEWSPAPER advertising of Ontario apples and other fruits has been carried on by the Ontario Department of Agriculture and the Niagara District Publicity Association, and was strengthened by special assistance from the Dominion Government in 1914 and 1915. Our Department by vote of the Legislature supplemented a revenue to this association to the extent of \$333 and are prepared to do the same for any other county or district association carrying out similar work.

The Ontario Department of Agriculture has confined its advertising entirely to the Prairie Provinces, using the weekly farm papers and a number of the semi-monthly and monthly papers. Our object in such advertising has been to reach

the farming classes in these provinces, as we believe that they are capable of consuming much larger amounts of our fruits than is now the case.

In addition to the direct advertising, this Department has issued, from time to time, bulletins and pamphlets on the preparation and uses of fruits, and has employed demonstrators at our various exhibitions to popularize the consumption of more fruit among these classes. Such work has been directly under the Institutes Branch. Exhibits of the various kinds of fruits have been made both in the West and in Ontario so as to keep before the public the fact that Ontario is producing the finest of fruits in enormous quantities and is supplying them to our people at reasonable rates.

BRITISH COLUMBIA

BY R. M. WINSLOW, B.S.A., PROVINCIAL HORTICULTURIST AND INSPECTOR OF FRUIT PESTS

THE Provincial Department of Agriculture has, for a number of years, given attention in increasing degree to the creation of a consumer demand for British Columbia fruit.

In the year 1909, a Markets Commissioner was appointed to spend the summer and fall seasons in the prairie markets. The purpose was, largely, to report to the producers on market conditions and, especially, on improvements necessary; but the Markets Commissioner, even in the first year of his work, devoted himself largely to making British Columbia fruit better known to the wholesale and retail trade.

In the following year, 1910, a start was made by the appropriation of \$500 for the advertising of British Columbia fruit, and this amount was continued in successive years.

In 1914, a year of large production, display advertising of British Columbia fruits was carried in the principal papers of Alberta for several months. Apple weeks were held in Calgary, Vancouver and Victoria, and were very successful in promoting the consumption of apples. They also had an important effect, especially in coast cities, in diverting the trade from imported to Canadian apples. The British Columbia Fruit Growers' Association also issued 100,000 eight-page booklets on "British Columbia Fruit," which were widely distributed, both directly to consumers and in fruit packages.

In 1915, the amount of advertising was greatly increased by a special grant for that year from the Federal Department of Agriculture. An illustrated booklet of 80 pages was printed in an edition of 30,000 copies and was widely distributed to con-

sumers, especially in western Canada, though requests for it came from many parts of the Empire, as well as the United States. Several window hangers in colours were gotten out and were largely distributed through the wholesale trade and by the Markets Commissioners to the retail grocers. The principal feature of the advertising was again the use of display space in newspapers and farm journals, the advertising running from the middle of June to the end of November.

By having the coast and prairie Markets Commissioners with offices at Vancouver and Calgary, respectively, in charge of the advertising campaign, it was possible to devote a great deal of personal attention to details, and this personal attention did much to contribute to the very successful results secured.

In 1916 the plans call for a campaign much along the lines of 1915. The British Columbia Fruit booklet has already been issued in a revised edition of 30,000 copies. As a result of the distribution last year, the demand for the booklet is already very great. Newspaper display advertising is being carried along the same lines as last year and a special campaign on "Preserving without Sugar" is being conducted both on the coast and prairies.

Fluctuating crop and market conditions, as well as the changes which occur in the purchasing power of communities, are important items in determining the variation of details necessary for the most economical as well as the most efficient advertising, but, given attention to such details, advertising for British Columbia fruits is proving a good investment.

FARM MECHANICS

In order to bring together the provision made by the various agricultural and educational institutions throughout Canada for instruction in Farm Mechanics, there is herewith given a series of articles containing an account of the work accomplished and in progress, dealing with the courses given, the methods of imparting the information, means of securing machinery for demonstration purposes, the scope covered by the examinations and other prominent features:

NOVA SCOTIA

BY M. CUMMING, B.A., B.S.A., SECRETARY FOR AGRICULTURE

WE have not, at present, a department of farm mechanics in connection with the Agricultural College at Truro. Mechanical drawing is taught by the principal of the manual training school in the town of Truro. The use of farm machinery is taught by the Farm Superintendent, J. M.

Trueman. In addition it has been our practice every year to secure for some two or three weeks a mechanical expert on farm machinery to give instruction especially on gasoline engines, but also to some extent on other kinds of farm machinery. This is a department of the College which I hope to strengthen ere long.

MACDONALD COLLEGE

FARM Mechanics, Manual Training and kindred subjects are, at Macdonald College, classified under the head of Agricultural Engineering, which subject is confined to the students of the first and second years.

COURSES OF STUDY

The six courses of study offered are outlined in the College Announcement, for 1915-16, as follows:

Course 1—Drawing. Freehand — sketches of simple objects and parts of machinery. Mechanical—geometric problems, lettering, isometric and orthographic projection. Working drawings used in workshop. Agricultural—plans and elevations of farm structures. Six drawings required.

Farm Carpentry. Timber—identification, characteristics and uses of principal varieties suitable for use on the farm; preservation.

Benchwork—principal woodworking tools and tool operations. Joints and their application to construction on farm.

Farm Structures—types, of buildings, foundation, framing, roof construction. First Year: One and one-half hours per week.

Course 2—Farm Blacksmithing. Metallurgy of iron; calculations for stock; forge-construction; tools—hearth, anvil, bench, their uses and care. Typical exercises—tapering, bending, drawing out, upsetting, punching, scarfing, welding. The making of simple articles as staple, hook, bolt, nut, etc.; repair work. Working in steel—tempering such articles as cold chisel, punches, springs, etc. Bench work; sheet metal soldering, forming; riveting, chipping, filing, elementary plumbing. Second Year: Two hours per week.

Course 3—Farm Machinery. Uses of cement and concrete on the farm Silo construction. Knots and rope splicing. A study of tillage and seeding machinery. First year: Two periods per week for three months.

*Course 4—*A brief study of the mechanics of materials; transmission of power, operating, adjusting of farm implements; such as haymaking machinery, harvesting machinery, threshing machines. Fanning mills; farm power; gasoline engine—principles, construction and operation. The

care and repair of farm machinery. Installation of water systems in country homes. Second year: Three lectures and one laboratory period per week for three months.

Course 5.—Agricultural surveying and drainage—measuring, field methods. Map making, computing areas. Instruments for levelling. Definition of terms; principles of farm drainage; laying out the drainage system. Capacity of the drains, open ditches. Drainage districts. Second Year: One lecture and one laboratory period per week for first term.

Course 6.—Roadmaking—history, earth roads, sand, clay, and gravel roads—stone roads. Road machinery. Culverts and bridges. Second year: One lecture per week for one term.

The Agricultural Engineering department will also advise farmers throughout the province of Quebec regarding farm structures, farm power, the installation of water and sewage systems, and kindred matters, as covered by the courses of study outlined in the foregoing.

ONTARIO AGRICULTURAL COLLEGE

BY JOHN EVANS, PROFESSOR OF MANUAL TRAINING

THE advent of many new farm implements within recent years, and the increased use of machinery in farm operations, have necessarily created a demand for courses of instruction which would enable the farmer to operate machinery intelligently and efficiently. The authorities of the various agricultural colleges, ever ready to provide whatever seems to them beneficial to agricultural interests and farming practices, soon began to institute courses having for their aim the best and most economical methods for doing the mechanical work of the farm. This is as it should be, for nothing has been a greater factor in making agriculture an agreeable vocation as the application of power to farm work through improved farm machinery. This innovation in farm operations has taken place to such an extent, and is being so rapidly extended, that success in modern farming practice depends, in a large measure, upon the skilful handling and management of machinery, and upon motors to operate them.

A course of instruction in wood-working and drawing was commenced here in January, 1903, and was carried on in temporary quarters, but the growth of the work soon justified better accommodation and

facilities for its more effective progress. Early in 1905 the erection of a new building was commenced, and was completed and occupied during the spring of 1906.

This new and commodious building designated "Machinery Hall" is a two-storey building of red-pressed brick on a limestone foundation, 146 feet long by 64 feet wide. The north-west wing and the central portion are devoted to manual training and farm mechanics. In the basement of this wing is the forge room, well equipped for instruction in metal work and blacksmithing. The basement of the central part provides accommodation for the storage of farm machinery and implements.

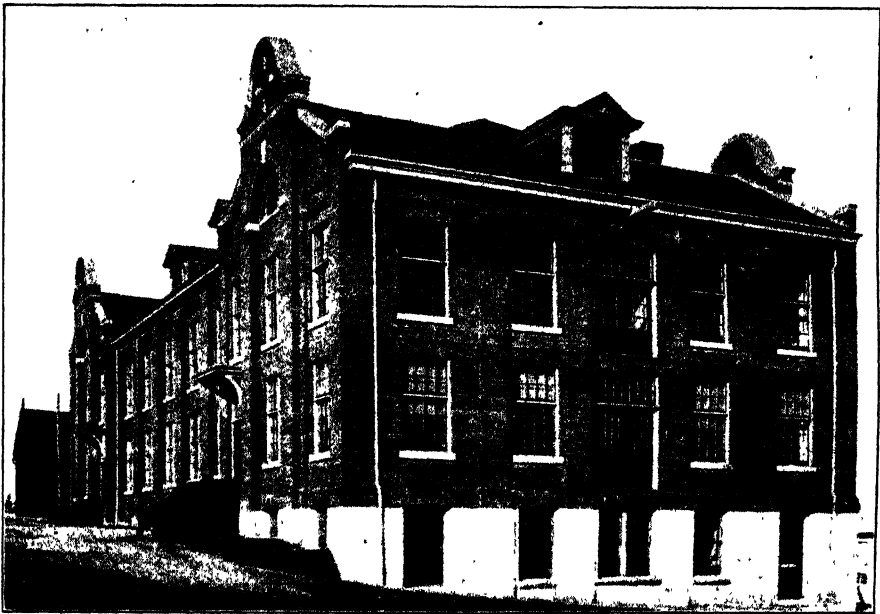
On the first floor are situated the machine shop, offices, and storerooms. Across the corridor is "Machinery Hall" used for demonstrations and instructional purposes in farm machinery. It also contains a unique collection of domestic utensils, and farm implements and machinery of early pioneering days.

The second floor is taken up with class rooms for woodworking, drawing, offices and storerooms. The south-west wing of the building is occupied by shops for the farm carpenter, blacksmith and painter.

With increased and adequate permanent quarters the course was de-

veloped to furnish the student an opportunity to become acquainted with the working methods and manipulations of machinery of the utmost importance in the cultivation of the soil, and other farming operations; an opportunity to get an understanding of the fundamental principles underlying and affecting farm implements and machinery with reference to their construction, operation, adaptability, efficiency and durability; and of gaining a practical knowledge of how to overcome the

struction of a plough, its draft and effect upon different kinds of soils, he must handle and learn how to manage it so as to cut a straight furrow, by actual practice; to demonstrate to him that this kind of knowledge must not be something apart from his life work, but a part and parcel of it, and that the man who shirks the practical work of the course loses a great deal more than he is aware of. It was considered that to acquire this special knowledge of the special matters, which constitute the



MACHINERY HALL, ONTARIO AGRICULTURAL COLLEGE, GUELPH

difficulties encountered in operating modern farm machinery; to show the young farmer how the simple principles of mechanics enter in curiously different ways into his farming practices; that however able he may be as a chemist or a botanist, there is knowledge which cannot be learned through books alone, and which can be acquired only through actual contact; that to know the properties of materials he must chip, file, pare and plane; that to understand the con-

life work of the student, is even as necessary to insure success as the obtaining of a broad general knowledge of general affairs, as the course is adapted to equip the individual for the battle of life in the best possible manner, and with the least expenditure of energy.

No attempt is made to give the students a technical training in any of the mechanical arts, but it is deemed expedient to impart such of the fundamental principles of mechanics as

are involved in the construction of the various machines and implements employed on the farm; and to afford every opportunity to acquire skill in the manipulation of tools, and an understanding of the structure and use of materials commonly employed in general repairs and construction on the farm, to gain accuracy and neatness in execution of work, and independence and self-reliance, thus giving him the ability to prolong the life or add to the effectiveness of his equipment. A brief outline of the course follows:

FIRST YEAR

Woodworking—Three hours per week for one term:

- (a) *Drawing*—Freehand sketches of simple objects—implements and parts of machinery, geometric problems, isometric projection, working drawings of objects made in workshop.
- (b) *Benchwork*—The use, care, sharpening, grinding and adjustment of the jack, smoothing, block and jointer planes; chisels, gouges, brace and bits; rip, cross cut, tenon and turning saws; simple joints—their construction and application. Simple useful objects—hammer handle, nail box, trap nests, etc.
- (c) *Timber*—Its preservation, principal varieties of wood and their leading uses.

SECOND YEAR

Metal Working—Three hours per week for one term:

- (a) *Drawing*—Freehand sketches of implements and parts of ma-

chinery. Projection, machine details—bolts, nuts, screw threads. Working drawings of objects made in workshop.

- (b) *Forge*—Fire and heat. Tools, hammer, chisel, fuller, swedge, their care and use. Typical processes—drawing, bending, forming, twisting, and welding—making simple objects,—gate hook, ring, staple, welded eye.
- (c) *Machine Shop Practice*—Chipping, filing, fitting, cutting screw threads; hardening and tempering cold chisel; nuts and bolts, hinges, etc.
- (d) *Sheet Metal*—Soldering, forming, riveting,—tin cup, funnel, etc.
- (e) *Farm Machinery*—The tools, implements and machinery of the field—mowers, self-binders, ploughs, seeders, rakes, etc. Power machinery—the construction, efficiency, and operation of gasoline engines, feed cutters, etc. Practice in detaching and setting up machines and implements.

For practical work in farm machinery a large assortment of different makes and designs of machines for general farm purposes are on exhibition in "Machinery Hall." These are loaned by various firms on the understanding that they be used for instructional purposes.

The exhibits afford the student and the visitor a most valuable opportunity to become acquainted with the various patterns and makes for comparison, from which they may draw conclusions as to the machine most likely to meet their individual requirements.

MANITOBA AGRICULTURAL COLLEGE

BY L. J. SMITH, B.Sc., PROFESSOR OF AGRICULTURAL ENGINEERING

THE agricultural engineering work taught at the Manitoba Agricultural College might be divided under three heads:

1. That given to our diploma course students.
2. That given to our degree course students.
3. That given to special courses.

In the Diploma course the work given is as follows:—

FIRST YEAR

Wood Shop—Forty Afternoons

This is an elementary wood shop. The student here first learns to properly handle the various tools and keep them sharp, and in good adjustment. The exercises given

are of as practical a nature as possible, all the work being done from blue prints and drawings, with the idea of making the student familiar with the practical reading of the same. Special attention is given to doing fine, accurate work.

Forge Shop—Forty Afternoons

How to build a fire properly and keep it clean; the care of forge tools; drawing out iron; making hooks, staples, bolts, grab hooks, etc.; making and repairing a chain flat and round iron welding, and general forging up to tool steel work.

Gas Engines

Eight lectures and twelve laboratory periods.

Lectures covering the principles and construction of stationary gas engines and accessories, including carburetors, magnetos, lubricators, and systems of ignition, also lectures on fuel, oils and horse-power. Some work is given on automobiles.

Laboratory exercises in gas engine study, ignition study, wiring and operating engines, brake horsepower, test, dismantling engines, carburetor study, valves, engine troubles, etc. Special emphasis is laid on gas engine troubles. A text book on gas engines is required for use in connection with this work.

SECOND YEAR

Building Construction—Ten Lectures

Foundations: How to lay out a building and put in walls and footings.

Framing: Beginning with the sills, the subject takes up common framing and building construction, giving the names and sizes of all parts. Silo construction.

Drawing: A few periods are given to principles of drawing.

A text book is required for this work.

Forge Shop—Twenty half Afternoons.

Advanced forge work; drawing out tool steel; making scratch awls, punches, drills, chisels, etc., and properly tempering the same; and making tongs. A demonstration is given in correct methods of horse shoeing, also safe methods of handling unruly horses in the shop.

Farm Mechanics and Concrete Construction—Twenty Lectures and Twenty Laboratory Periods

Mechanics: Lectures and outside reading covering the following subjects. Steam engines and boilers, the various types, their construction and operation, valve setting,

power transmission, belts, use and care, proper widths, systems of belt lacing, sprocket, friction and rope drives, gearing, figuring size and speed of pulleys, gears, etc., bab-bitting, soldering, pipe fittings, valves, taps and dies, lubrication. Also lectures on road construction.

The laboratory work will consist of engine examination and operation, valve setting, engine adjustments, examination of accessories, bab-bitting, soldering, pipe fitting, belt lacing, drilling and tapping, machinery repairs, rope splicing and harness repairs.

Concrete: This includes lectures on lime; cements; sand, gravel and crushed stone for concrete work; method of mixing and placing concrete; form work; method of re-inforcing and proper setting of concrete.

Laboratory work; making tile, building blocks, fence posts, walks, etc.

THIRD YEAR

Farm Sanitation—Twenty Lectures

Lectures on some of the modern mechanical conveniences and improvements closely related to the farm and home, such as the various systems of water supply and sewage disposal, wells, their proper location, pumps, plumbing repairs, house-heating, hot air, hot water, and steam systems, ventilation, protection of buildings from lightning, elementary drawing of farm buildings.

Traction Engineering—Ten Lectures and Twenty Afternoons

Lectures on steam and gas tractors, separators, tractor transmission and lubrication, pumps and injectors and other tractor accessories.

Laboratory work in examination and operation of tractors, adjusting of engine parts, valve grinding, packing, care of boilers, calking and expanding boiler flues, valve setting, key fitting, balancing of pulleys, etc. Text books on traction engines are required.

Building Construction—Ten Afternoons

Instruction in saw filing, mixing paints, cutting rafters and the use of the steel square. The students will build the smaller farm buildings to scale in order that they may become familiar with the details of carpentry. A few lectures are given on estimating labour and materials for common farm buildings.

Farm Machinery—Ten Lectures and Twenty half Afternoons

This course includes work in the examination and comparison of the most im-

portant farm machines. Work in knocking down, assembling, and adjusting the various parts is given in the laboratory, supplemented by lectures and demonstrations. This course also includes lectures on road construction and machinery.

DEGREE COURSE

Except where those students are taking the agricultural engineering option, the Degree course students do not get a great deal of agricultural engineering. In the third year they get twenty lectures on farm sanitation, which takes up such subjects as farm water supply, the source of contamination of the water supply, methods of storing and pumping water, farm plumbing systems, sewage disposal systems, the various methods of house heating, such as hot air, hot water and steam heating, house and barn ventilation, protection of buildings from lightning, etc.

In connection with these lectures the students receive twenty-one and one-half hour periods of drawing instruction on plans of farm buildings and plumbing systems, sewage disposal systems, etc.

In the fourth year any of the degree students may choose surveying as an option. Under the head of surveying the students get twenty lectures and twenty afternoons on the care and use of the ordinary surveying instruments, paying particular attention to land surveying and road work. The Department of Soil Physics deals with the subject of drainage.

In the fifth year they may choose farm machinery as an option. Under the subject of farm machinery the students have ten lectures and twenty afternoons' work in the study and comparison of farm machinery, setting up the various machines and making tests of a number of them. Tests are made of fanning mills, feed grinders, etc.

To those students taking the agricultural engineering option the last two years of the Degree course are

quite largely devoted to the following engineering subjects with as much practical application as possible to agricultural conditions:—

FOURTH YEAR

Machine and forge shop work.
Surveying.
Mechanical drawing.
Mechanics of engineering.

FIFTH YEAR

Machine and forge shop.
Mechanical drawing.
Farm machinery.
Mechanics of engineering.
Civil engineering.
Concrete.

The agricultural engineering students are required to hand in a thesis on some engineering subject relating to agricultural conditions.

STEAM TRACTION ENGINEERING

We are giving under the head of short courses a short course in Steam Traction Engineering and one in Gas Traction Engineering each year. These courses are well attended and we trust in the future to give other practical short courses along some of the lines which are given our regular agricultural students.

It is almost impossible to give detailed information as to the method of instruction followed in these various subjects, as they vary a great deal, depending on the subject. In the forge shop we have a little "bleacher" upon which the students sit and the instructor has a forge in front and gives a demonstration of the exercises to be made at the beginning of the laboratory period. He may find it necessary to call the class up to repeat this demonstration before the afternoon laboratory period is over. Each exercise given in our first year forge shop course is laid out on separate boards, showing each step as given by the instructor in his demonstration. This we have found to be of great assistance to our beginners in forge shop in helping them to get the proper methods of going at the

various exercises. In our second year forge work we consider that the students should have acquired enough ability to be able to go ahead with the work after the demonstration has been given without having anything further to direct them.

Our work in elementary wood shop does not differ greatly from that in any institution giving this line of work. In the second course in building construction we lay a good deal of stress on the use of the steel square for laying out rafters, and the students who have taken our second course in wood shop and in building construction have no difficulty in building the ordinary farm barn. Some of them have even built houses.

For our work in steam engines and gas engines we have a number of models for demonstration work, making it easy for us to explain the principles of the various engines to the students in the class room. We combine the demonstration method of instruction as much as possible with our lecture work. The various farm machinery firms have been very kind in giving us every possible assistance, by loaning us stationary gaso-

line engines, steam, gasoline and kerosene tractors and any amount of farm machinery. In this way our engineering building is heavily equipped with a good deal of machinery that is given us on loan and to be returned to the farm machinery firms generally inside of two years for the purpose of getting out the more improved and later types of machinery.

Some of our examinations are practical examinations, but nearly all of our subjects are covered by written examinations as well. A great many of the exercises in the laboratory require the handing in of answers, or a description of the proper methods of procedure for each given exercise. These count also in connection with our examination work.

Our instructor in wood shop gave a short course in building construction in one of the smaller agricultural towns in the province last summer. This short course was very successful and the town in which it was held is anxious to have another given this coming summer. It is quite possible that our department will carry on quite a good deal of short course work among the boys in the country in the near future.

SASKATCHEWAN COLLEGE OF AGRICULTURE

BY A. R. GREIG, B SC., PROFESSOR OF AGRICULTURAL ENGINEERING

THE first-year student in manual training spends two afternoons a week for one term in the blacksmith shop, where he is taught the management of the forge and tools, the drawing out of iron, the making of conveniences for the farm. The exercises are so graded that his development will be gradual and he has to complete each exercise in a satisfactory manner before he is permitted to go on with the next.

We have in our blacksmith shop thirty-six forges and anvils, and a complete set of blacksmith tools for each. At the beginning of the per-

iod the instructor demonstrates the work for that day, pointing out the difficulties and the proper method of doing the work, so that at the end of the first term, any one of the students would be able to make any of the ordinary repairs on the farm.

SECOND TERM, FIRST YEAR

The second term in the first year, two afternoons a week the students spend in the carpenter shop. Here we have thirty-six carpenters' benches and complete sets of tools. Here the student is taught to handle the tools properly, how to sharpen

them. He is taught the nature of the different kinds of woods and also the joints in framing, so that at the end of the term he would be able to undertake the framing of any of the farm buildings. He could build a sash, door or frame. In all this work, we have tried to make it as serviceable as we could for the work on the farm.

The first-year student has also one period per week in the drafting room, where he is taught to handle the drawing instruments, to make geometrical drawings, and finally to make mechanical drawings from the models. It has been our custom to use as a model for drawing the work they are to do the next day in the carpenter shop, and we find that it helps very materially to the understanding of mechanical drawings.

THE SECOND YEAR

In the second year, the students spend their laboratory periods and receive lectures on farm machinery. For this purpose, we have a laboratory 125 feet long by 175 feet wide, in which we have over \$13,000 worth of farm machinery supplied by the manufacturers of farm implements. These firms, or their representatives in the West, have been sufficiently enterprising to keep us stocked with the most up-to-date samples of practically all the farm machinery that is on the market in the West. Here the student has to make working tests of the different farm machines, study the material in their construction, and is given lectures on the proper care and

handling of same. We also have for the student in the second year a laboratory in farm motors, and, as in the farm machinery department, the manufacturers have supplied us with a full equipment of both small gasoline engines and various sizes of the large tractors. In this department the student is given a thorough grounding on the principles of the gasoline engine. He is required to adjust the valves, the ignition, etc., of the engine and to make an efficiency trial, so that at the end of the term, he would be capable of handling any of the farm tractors.

The drawing in the second year consists of making plans of various parts of farm machinery, working out the strengths of their materials and making complete inked-in working drawings.

THE THIRD YEAR

In the third year the students get lectures on surveying. In the laboratory period they make chainage surveys of different portions of the grounds. They also receive instructions in levelling so as to enable them to run any of their roads or ditches. They receive a course in building construction, covering the strength of material and the suitability for construction purposes, the layouts of the various types of farm buildings, the heating and ventilating of farm buildings, water system and sewage disposal. In this year their drawing consists of plans and elevations of farm buildings, the drawing up of the bills of materials and specifications for same.

ALBERTA SCHOOLS OF AGRICULTURE

BY JAS. McCAIG, EDITOR OF PUBLICATIONS

IN the Alberta Provincial Schools of Agriculture what is formally called manual training in technical institutions is approached and dealt with from practical beginnings

and is conceived and carried out for direct efficiency in meeting actual farm problems and needs. The course is included in the more comprehensive body of work called farm

mechanics. The general purpose of the course is to give practice for the sake of economy in the making of simple implements, and the making of repairs; instruction and practice in the constructing of modern building and other surface equipment; the care, operation and conservation of power and other machinery of the farm. It takes account of the following branches of work:

Mechanical Drawing. The drawing is the expression of the idea, or representation of the thing to be concretely produced. It involves a study and knowledge of the mathematics of construction, the making of measurements and the use of a scale. In its higher aspects it takes account of the making of blue prints, designs and plans of buildings, in addition to simple objects.

Woodwork. An initial study in the uses and the care of tools is made before this work is begun, followed by the construction of useful and necessary articles about the farm, such as wagon boxes, whiffletrees, wheelbarrows, fences, gates, doors. Considerable attention is given to ordinary repairs.

Buildings. Building work begins with planning and plan-making, and proceeds to the study of materials, the construction of model buildings as well as their lighting, ventilation and drainage. In the second year of the course considerable attention is given to the grouping and arrangement of the complete set of buildings for convenience, appearance and effect of the total farm-steading.

Cement. The preparation and uses of cement for walls, footings, posts, troughs, tanks and walks is practically taught.

Blacksmithing, includes the making of common, useful articles, such as chains, hooks, clevises, whiffletree irons, wagon box irons, and also repair work, plow-pointing and horse-shoeing. Horse-shoeing is carefully related to veterinary instruction in the care of the horse's foot.

Farm Machinery. The instruction in machinery is carried on by specialists and experts in various kinds of machinery. The structure, operation and care of the gasoline engine receives special attention. The steam engine and wind and water power are also studied. Practice is given in the taking down and setting up of farm machinery and implements. The conservation of farm equipment is strongly emphasized.

Even in the matter of watering, nature cannot always be improved upon. In a garden contest in Missouri the gardens were divided into wet and dry classes, so that the gardens which depended entirely on rain might not be compelled to compete with those which had the advantage of plenty of hydrant water whether it rained or not. Curiously enough the dry gardens were much better than the wet gardens, probably because there was sufficient rain throughout the contest to supply all the moisture the plants could profitably use, even though it didn't rain every day.

NOTES FROM DISTRICT REPRESENTATIVES

QUEBEC

PORTNEUF COUNTY

J. C. Magnan, B.S.A.:—

"The women gardeners' club of the city of Three Rivers, organized on April 13th, has now a membership of 82 young girls and women. This organization, the object of which is to improve the lawns and encourage the members to cultivate a home garden, will certainly be of great benefit to the city.

"A demonstration garden of 100 by 100 feet was established in the city. Every member of the club has to cultivate a plot of 15 x 4 feet, growing lettuce, radish, carrots, etc. In the centre of the garden is a bed of flowers to which all members of the new organization have to give attention. This should be of great value in encouraging the improvement of lawns and of private gardens in the city."

DRUMMOND AND BAGOT COUNTIES

R. A. Rousseau, B.S.A.:—

"Part of this month was taken up by the distribution of eggs for natural incubation to school children of the different parishes. Not many have entered so far in the bacon hog feeding contest, as young pigs for feeding are scarce. This encouragement to such an important branch of breeding is

certainly well timed, as some farmers' clubs give sufficient encouragement to the breeding of hogs of the bacon type."

BELLECHASSE AND DORCHESTER

Albe Raymond, B.S.A.:—

"At Ste-Marguerite de Dorchester, I found that a large quantity of so-called complete chemical fertilizers had been purchased by the farmers. I examined several of these fertilizers and found only one or two samples containing from one to two per cent of potash. The others did not contain any at all. Many farmers are thus deceived when they buy fertilizers. They are sold at high prices fertilizers which are said to be complete, and which, as a matter of fact, contain only two elements of plant food."

ROUVILLE AND IBERVILLE

Henri Cloutier, B.S.A.:—

"Nearly 2,000 eggs were distributed this year to the boys of nine rural schools in the parish of Marieville. Each boy received a dozen eggs. Judging from the enthusiasm which is shown by all the pupils, very satisfactory results may be expected this fall."

ONTARIO

NORFOLK COUNTY

E. F. Neff, B.S.A.:—

"Each week there has been considerable milk and cream left at the office to be tested but this quantity was greatly increased the past week. A number of men are awakening to the value of having their cows tested and in one case a gentleman brought in a sample of milk from each of his 16 milch cows. He is going to make another test very soon and will dispose of those cows which do not show up favourably as regards percentage butter fat in the milk."

NORTHUMBERLAND COUNTY

R. S. Beckett, B.S.A.:—

"We have also had a number of samples of milk brought into this office to be tested and the prospect of paying by test rather than by volume, by the cheese factories is creating an active interest in the test problem. The passing of the act with regard to paying by test will certainly lead to the improvement in the butter fat production in the herds, as too little attention has been paid to this in the past."

WATERLOO COUNTY

J. S. Knapp, B.S.A.:—

"On Wednesday afternoon the directors of the South Waterloo Agricultural Society had a meeting in the office to revise their prize list. They added one class which might be of interest to the Department, that is a class for Baby Beef Steers under one year. As I mentioned in a previous report about half a dozen calves in the neighborhood of Galt are being fed for the amateur class at the Winter Fair."

LENNOX AND ADDINGTON COUNTY

Speaking of the organization of a new Board of Agriculture, G. B. Curran, Napanee, says:—

"The vice-president at Napanee is Mr. Ross Hogle, vice-president of the Odessa Junior Farmers' Improvement Association. Mr. Harry Pringle of the Napanee Agricultural Class of 1913 was elected one of the directors. This new young blood should stimulate the board of agriculture. All members of the board are picked

farmers and should do much to put life in the organization and all are going to make a special effort the first year to give the new board of agriculture a start."

WENTWORTH COUNTY

J. N. Allan, B.S.A.:—

"During the week I visited the drainage demonstration plots in this county. Fall wheat was sown last fall in the plot on Mr. Switzer's farm, and I think I am quite safe in saying the wheat is six inches higher on the drained than on the undrained land, besides having a much darker and healthier green colour. The plot on Mr. Dickenson's farm was sown to oats this spring. The oats are looking very well while on the undrained part of the field, at least twenty-five per cent has been drowned, and the remainder is smaller and does not appear nearly so healthy. I am anxiously awaiting the time when we will know the yields from the drained and undrained land, and feel quite sure the farmer will receive enough additional grain this year to pay for his share of the under-drainage."

VICTORIA COUNTY

A. A. Knight, B.S.A.:—

"On Thursday I approached the county council for an additional grant of \$100 to help out in school fair prizes. Although there were quite a number who objected to the county making such a grant on the grounds that the municipalities concerned should bear the cost, yet there was a substantial majority in favour of it, and the grant was given. Most of those who objected were from the towns and incorporated villages. The general opinion of the council, however, was that the school fair movement was a splendid thing; one of the members going so far as to say that in his opinion it was the best thing that the Department had ever done for the rural districts."

DUNDAS COUNTY

E. P. Bradt, B.S.A.:—

"I have had interviews with three young men in the county during the past week who are planning to take a course at Guelph, beginning next fall. I am glad to state that these young men are all students of our short courses. This would appear as though the short courses, as conducted by the District Representatives, are means of influencing quite a number of young men to attend the Guelph College. The work which we cover is sufficient to give them a desire for further information along the same lines. In talking with those three students they all stated that they had never thought of attending Guelph until spending a month at the short course. It is incidents

of this kind that bring out the real value of the short course to the young farmers of the province."

SIMCOE COUNTY

J. Laughland, B.S.A.:—

"It is very interesting to watch the results of the school fair work throughout the county. A few days ago I received a letter from a teacher in a school that took part in the work last year for the first time. The letter states that early this spring the pupils had what they called an 'egg day', when fifty-eight dozen eggs were gathered and sold for cash for patriotic purposes. A little later the teacher introduced manual training and the domestic art. The articles turned out were wonderful. These along with small wares from firms were sold and fifty-two dollars realized for the war fund. Besides this the boys put up basket ball posts on the school grounds. The teacher also arranged with each pupil to plant a small plot of potatoes and, when marketed, the proceeds will go for patriotic purposes. The teacher states that the pupils are planning and working all the time after school hours. One boy has a plot of barley full length of the field two seed drills wide, planted from seed saved from the plot he had last year; others saved aster seed and potatoes, which they have planted this year. It seems to me the above results accomplished in one school are marvellous, and show the possibilities of the school fair movement, in teaching the pupils habits of industry, thrift, and the capacity of assuming responsibility."

HASTINGS COUNTY

A. D. McIntosh, B.S.A.:—

"During the past week I visited what is perhaps the first field of sainfoin grown in eastern Ontario on the farm of Mr. Thos. Wootton in the township of Rawdon. Mr. Wootton's father imported a bag of sainfoin clover seed from England over 20 years ago. From his first sowing he had poor luck, but, being a Britisher, he stuck to his guns and in the course of a few years had several acres of a thriving crop of sainfoin. Mr. Wootton now has 25 acres, some of which have been down for 15 years, producing quite regularly two crops per season, usually one of hay and one of seed. Last year Mr. Wootton sold 150 bushels of seed from 14 acres at remunerative prices. When the fields are in full bloom they present a beautiful sight. Mr. Wootton has recently gone into purebred Shorthorn cattle, counting on the excellent feeding qualities of his sainfoin clover to help him make a success of the business. Several neighbouring farmers are trying sainfoin this year on Mr. Wootton's recommendation."

QUEBEC

THE MAPLE SUGAR AND SYRUP INDUSTRY

BY J. ANTONIO GRENIER, L.L.L., DEPUTY MINISTER OF AGRICULTURE FOR QUEBEC

THE maple syrup and sugar industry is developing in the province of Quebec to an extent that no one would have imagined possible twenty years ago, and I am convinced that a great future lies before this branch of agriculture, somewhat neglected in the past. During the last two or

that before long it will yield the province a revenue of three or four million dollars a year. Even now, the annual yield of our maple groves in sugar and syrup has an average value of two million dollars. The census of 1911 gives only \$1,698,279, but this value has certainly reached the amount of two million dollars,



MAPLE SUGAR AND SYRUP SCHOOL, STE. LOUISE, L'ISLET, SPRING OF 1916

three years, the endeavours that were made towards its improvement, largely with funds provided under THE AGRICULTURAL INSTRUCTION ACT, have given magnificent results, and well informed people state

were it only by the increase in prices that has taken place during the last five years. This is a very satisfactory revenue for the farmer, especially as it is earned at a time of the year when there is nothing else to do.

The production was very good this spring in Beauce, good in the Eastern Townships and below the average in the vicinity of Montreal.

The quality of the produce, as a whole, has improved in a large number of districts and our instructors, as well as the buyers, note that sugarmakers pay more attention than heretofore to modern methods and gradually equip their sugar-houses.

Good results have also been obtained from the short course, the practical demonstrations, the new law concerning the adulteration of sugar and syrup and also from the work of the Quebec Cheesemakers' Co-operative Society, which has made a specialty during the year of selling maple sugar and syrup for its members.

This co-operative association has adopted the same method for maple sugar and syrup as for butter, cheese and the various farm products that are sold through its agency on the Montreal market. They are divided into three classes: No. 1, No. 2 and No. 3; every week the prices obtained for each quality are published and those who have sugar and syrup of third quality may easily see the amount they are losing by not manufacturing a choice product. The association also informs its members of the defects that are observed in making, packing, etc.

Up to the 31st of May, 1916, the association sold for the farmers, 41,269 pounds of sugar, 4,966 gallons of syrup, and the deliveries were far

from being completed. Last year, only 13,169 pounds of sugar and 2,241 gallons of syrup had been received. This rapid increase in the trade shows that the merits of this system are recognized as they should be.

For the sugar, the Association has paid the following prices: No. 1, 13¼ cents; No. 2, 11¾ cents; No. 3, 10½ cents. As to the syrup, No. 1 realized \$1.35; No. 2, \$1.25, and No. 3, \$1.05 a gallon.

These prices will surely go up with the quality, as our products become better known on the European market.

Maple sugar and syrup are considered as luxuries in France, somewhat like our Fameuse apple, and they may command very high prices.

Already sugar is being exported to the United States. So far, however, only black sugar or sugar of poor quality has been sent, but some firms, desiring to maintain their good reputation and that of their products, are now opening new and important markets for our sugar industry. They are sending large consignments of sugar and syrup to England, Scotland, Australia, and to the west and south of the United States.

A new sugar-making schoolhouse was opened this year at St-Casimir, Portneuf County. There are now four such schools. The following table shows that these schools were attended by large numbers of pupils and visitors:

SUGAR-MAKING SCHOOL OF STE. LOUISE, L'ISLET. DIRECTOR: L. J. A. DUPUIS

Pupils	14
Visitors	825
Syrup manufactured	265 gallons
Sugar manufactured	414 pounds
Wax (taffy) manufactured	650 pounds
Number of maple trees	4,000
Average price of sugar	20c. per pound
Average price of syrup	First, \$2; second, \$1.50
Length of the season: from the 28th of March to the 27th of April, 1916.	

SUGAR-MAKING SCHOOL OF BEAUCEVILLE, BEAUCE. DIRECTOR: JOS. BOLDEUX

Pupils.....	12
Visitors.....	958
Syrup manufactured.....	506 gallons
Sugar manufactured.....	433 pounds
Wax (taffy) manufactured.....	200 pounds
Number of maple trees.....	3,000
Average price of sugar.....	15c. per pound
Average price of syrup.....	\$1.50 per gallon
Length of the season: from the 26th of March to the 29th of April, 1916.	

SUGAR-MAKING SCHOOL DE LA MINERVE, LABELLE. DIRECTOR: JOS. H. LEFEBVRE

Pupils.....	3
Visitors.....	23
Syrup manufactured.....	330 gallons
Sugar manufactured.....	450 pounds
Wax (taffy) manufactured.....	25 pounds
Number of maple trees.....	3,000
Average price of sugar.....	15c. per pound
Average price of syrup.....	\$1.50 per gallon
Length of the season: from the 28th of March to the 22nd of April, 1916.	

SUGAR-MAKING SCHOOL OF ST-CASIMIR, PORTNEUF. DIRECTOR: M. J. A. TESSIER

Pupils.....	13
Visitors.....	653
Syrup manufactured.....	158 gallons
Sugar manufactured.....	705 pounds
Wax (taffy) manufactured.....	250 pounds
Number of maple trees.....	1,800
Average price of sugar.....	15c. per pound
Average price of syrup.....	\$1.50 per gallon
Length of the season; from the 27th of March to the 22nd of April, 1916.	

PRACTICAL DEMONSTRATIONS

The practical demonstrations given in school houses last year were so successful that it was decided this year to increase their number. A competent instructor was sent to fourteen sugar cabins, where a meeting of the sugar-makers of the local-

ity had been called. A total of 796 farmers was reached in this way, most of these makers of sugar and syrup taking great interest in the various making processes. The following is a list of sugar houses visited and the number of persons present at each demonstration:

PARISH	Proprietor of the Sugar-house	Attendance
St-Valier, Bellechasse.....	J. Aurélius Roy	75
St-Raphael, Bellechasse.....	Nap. Labrecque	25
St-Néré, Bellechasse.....	Pierre Dutil	65
Ste-Hénédine, Dorchester.....	Onésime Nadeau	55
Ste-Marguerite, Dorchester.....	Joseph Gagnon	50
Frampton, Dorchester.....	Lucas Brochu	60
Standon, Dorchester.....	Damase Audet	75
Ste-Malachie, Dorchester.....	Harry Henderson	30
Ste-Claire, Dorchester.....	Ad. Leclerc	125
L'Ange Gardien, Montmorency.....	Romuald Côté	50
Château Richer, Montmorency.....	Joseph Cauchon	25
Plessiville, Mégantic.....	Théodore Jam	53
St-Pierre-Baptiste, Mégantic.....	D. Berthiaume	58
St-Hugues, Bagot.....	Rev. E. H. Messier	50
		796

EXAMINATIONS AT THE OKA AGRICULTURAL INSTITUTE

THE Laval University has just granted the diploma of Bachelor in the Science of Agriculture to seven fourth-year students of the Oka Agricultural Institute: Messrs. Pierre Reboul, Coaticook; J. B. Cloutier, Champlain; Evariste Grisé, Montreal; Honoré Gagné, Sherrington; Emile Rou, La Durantaye; Alexandre Rioux, Caussapscal; Antoine Tremblay, Lac à la Tortue, Champlain.

The examinations for this diploma were made very much harder than usual this year. They consisted of: (1) a thesis or report, at the option of the candidate, subject to the approval of the topic by the authorities; (2) a written examination on sixteen different subjects of agricul-

tural teaching with three hours time for each subject. These subjects were arranged in five groups as follows: 1, live stock; 2, agronomy and special crops; 3, horticulture; 4, plant diseases; 5, agricultural chemistry and physics.

The examinations for the scientific course were held under the direction of the Secretary of the Laval University, Montreal. Eighteen third-year students were allowed to pass into the fourth class, twenty second class students into the third class, and twenty-five students—six of whom having studied in a classical college, are dispensed by their science degree to make a stage in the first class—will pass in the second class next year.

GRADUATES OF THE SCHOOL OF AGRICULTURE, ST. ANNE DE LA POCATIERE

OUR school year closes in December, so as to give our pupils a chance to find work for April or for the summer. The following list contains the names of those who completed their studies last December:

Joseph Albert, agriculturist, Bonaventure County.

J. Albert Sirois, professor, School of Agriculture, Ste. Anne de la Pocatière.

Allyre Genest, St. Bernard, Live Stock Branch, Ottawa.

Louis de Gonzague Fortin, farmer, St. Fabien, Rimouski.

Rodolphe St. Arnaud, St. Theophile du Lac, not employed.

Michel Belanger.

Antonio Mathieu, Department of Agriculture, Quebec (Poultry).

Arthur Landry, returned to his father's farm.

Jean-B'te Roy, returned to his father's farm.

Napoleon Jourdain, horticulturist, Grand'Mere.

Wilfrid Delaney, Department of Agriculture, Quebec.

Denis Ouellet, Notre-Dame du Lac.

Pierre Saint Hilaire, Montmorency.

Hyacinthe Bois, Garthby, Live Stock Branch, Ottawa.

Sauveur Gosselin, St. Francois de Montmagny.

You are not assisting Canada or the Cause by purchasing goods that come from neutral countries. Do not do so, unless it is unavoidable. Remember, Canada first; the Empire next, Allied countries third. Let our trade follow the Flag.—*Agricultural War Book, 1916.*

ONTARIO

THE GIRL GUIDES

THE Thamesville branch of the organization known as the Girl Guides, which is a sister organization to the Boy Scouts, has undertaken some work this year in the matter of vegetable growing. They are taking a plot of ground 4 rods x 8 rods, planting half of it in early potatoes and half in late. Two varieties of each are planted side by side so that the results may be compared. The District Representative for Kent County, in which Thamesville is located, is assisting

in supervising the work, although of course the District Representatives as a rule confine their work entirely to rural districts. Under his supervision the girls are spraying the potatoes, cultivating them, and are expected to weigh the crop in the fall and keep a careful statement as to the results. A suitable sign is being erected so that all those who pass may know of the work which is being done that in this way it may serve as a demonstration as well as be a matter of interest to the girls.

ALBERTA

CONVENTION OF WEED INSPECTORS AT CLARESHOLM

THE second convention of Departmental and Municipal Weed Inspectors for Alberta was held at the Claresholm Provincial School of Agriculture on June 27, 28 and 29. About one hundred inspectors were present besides farmers from the neighbourhood. The sessions were highly profitable and the inspectors moved unanimously to make the convention an annual fixture.

In addition to addresses from Hon. Duncan Marshall, Minister of Agriculture, Dr. J. G. Rutherford, of the Canadian Pacific Department of Agriculture, and H. A. Craig, Deputy Minister of Agriculture for the province, the following speakers contributed to the programme: W. C. McKillican, Rotation and Weeds; Arch. Mitchell, Shelter Belts; J. Perrie, Rural Councils and the Weed Problem; J. McCaig, Weeds and Sheep; E. H. Strickland, Weeds and Insect Pests; W. J. Stephen, The

Summer-Fallow; J. C. Hooper, Identification of Weeds; J. D. Smith, Weed Eradication; O. Blue, Weed Inspectors' Work.

The delegates to the convention made an inspection of the plot work of the school and also of the farm crops, stock and equipment and derived a good deal of profit from seeing the concrete working out of the principles of cultivation and cropping suited to local soil and climatic conditions. Cultivated fodder crops are being grown in great variety and abundance, the grain and root crops are the best that have been grown on the Claresholm farm and the dairy stock is in fine producing condition.

A resolution was passed favouring the setting aside of a fund of \$50,000 for the work of destroying weeds on unoccupied lands and the charging of interest at the rate of 10 per cent to owners for the money so expended.

BRITISH COLUMBIA

RURAL HIGHWAYS

BY J. E. GRIFFITH, DEPUTY MINISTER AND PUBLIC WORKS ENGINEER

THE policy pursued by this province in constructing and maintaining highways, trails, etc., is as follows:—

There are in all thirty-three districts, a road superintendent being appointed for each district,—this appointment is more or less a permanent one. The road superintendents generally appoint their own road foreman over each gang and hire the men and teams, the preference being given to residents of the district in which the work is being done. Roadwork, generally speaking, is done by day labour. Suitable machinery is used wherever conditions permit.

Each superintendent submits at

the close of the fiscal year an estimate in detail covering the cost of the maintenance of the existing roads and bridges, and also the cost and length, etc., of new roads to be opened up and bridges constructed, etc. New work is almost entirely governed by the opening up of new districts for settlement, the object being to render as much assistance as possible to *bona fide* settlers. Some assistance is also given towards roads leading to mines and other industries, if such are found, after investigation, to warrant the expense.

The total amount appropriated for public works during the coming year is \$3,023,010.00.

Short courses of instruction for inspectors of French speaking schools having been held at the agricultural schools at Ste. Anne de la Pocatière from July 24th to 29th, they were followed at the Agricultural Institute at Oka from July 31st to August 11th. At Ste. Anne de la Pocatière morning, afternoon and evening sessions were provided for, while at Oka the work was to be done almost entirely in the morning and afternoon. Lecturers were arranged for on general agricultural topics, including soil cultivation, crop rotation, drainage, apiculture, horticulture, the feeding of animals, etc. A feature of the course at Ste. Anne de la Pocatière was demonstrations by moving pictures of various practices in connection with field, orchard and garden work.

PART III

Rural Science

THE MODEL KITCHEN

One of the principal objects of Women's Institutes and Homemakers' Clubs is to encourage the use of labour saving appliances and methods in the home. To facilitate this result Household Science officials in different provinces have designed model kitchens for rural homes. The opinions of these officials with respect to the plan and equipment of these work-shops of the home are by no means uniform. In order that each may learn from the others there are brought together descriptions of model kitchens as they are understood at Macdonald College, the Saskatchewan Agricultural College, and the Department of Agriculture of British Columbia. Domestic Science authorities are invited to criticise or suggest improvements on the kitchens described:

MACDONALD COLLEGE

BY MISS A. E. HILL, MACDONALD COLLEGE

IN any work or profession in which practical work is entailed the worker has to have, to carry out his, or her work successfully, a work place or work shop. The scientist has a laboratory; the carpenter his bench; the artist his studio. To do good work this work-shop must be carefully planned, allowing the worker good light and plenty of fresh air; also, the equipment used must be arranged in a way that is most convenient for the worker and will save time, steps and energy.

In an attempt to save the worker, so that she will not be tired out at the end of the day, and, furthermore, worn out at the end of years as a result of misspending time, the following suggestions have been made:

1. Have windows arranged to admit plenty of light and air. These are both necessary for the health of the worker and for accomplishing good work.

2. Have the finish of the room one that is easy to clean, keep clean and is bright

and attractive. Any woodwork should be as plain as possible, and there should be an absence of corners and right angles. Food is kept and prepared in the kitchen, and consequently the room should be most sanitary.

3. Have the large equipment so placed that in the carrying out of a task in going from one fixture to the other retracing of steps is done away with and actual progress is made.

4. Have the small equipment and materials grouped around the fixture where they are used. This does away with useless steps and extra handling of equipment.

In short, have the kitchen a well-planned, well-arranged laboratory where the mental and not the physical work of the worker is at a premium.

ARRANGEMENT OF LARGE EQUIPMENT, VIZ., FIXTURES AND FURNITURE

These should be arranged so that those fixtures which are most closely related should be next to one another, or near one another. Thus steps may be saved and retracing of steps done away with, and the idea of progress actually carried out in performance of a task. For example,

the dish cupboard should be near the sink so that there will not be time wasted in carrying dishes some distance to be put away after they are washed. The larder, or pantry, is a good point from which to start in arranging fixtures, as it is where food is kept:

1. *Pantry or larder.*
2. *Table*—This should be next in order;

as a result, has gone in a continuous line from larder to dishing-up table, and is ready for the dining room.

5. *Cupboard for Dishes*—Unless there is a pantry between kitchen and dining room, with cupboards for dishes, there must be a cupboard in the kitchen for some of these. This should be near the dining-room door so as to save steps in setting the table for the meal.

The sink should be near by, as dishes when washed should be near

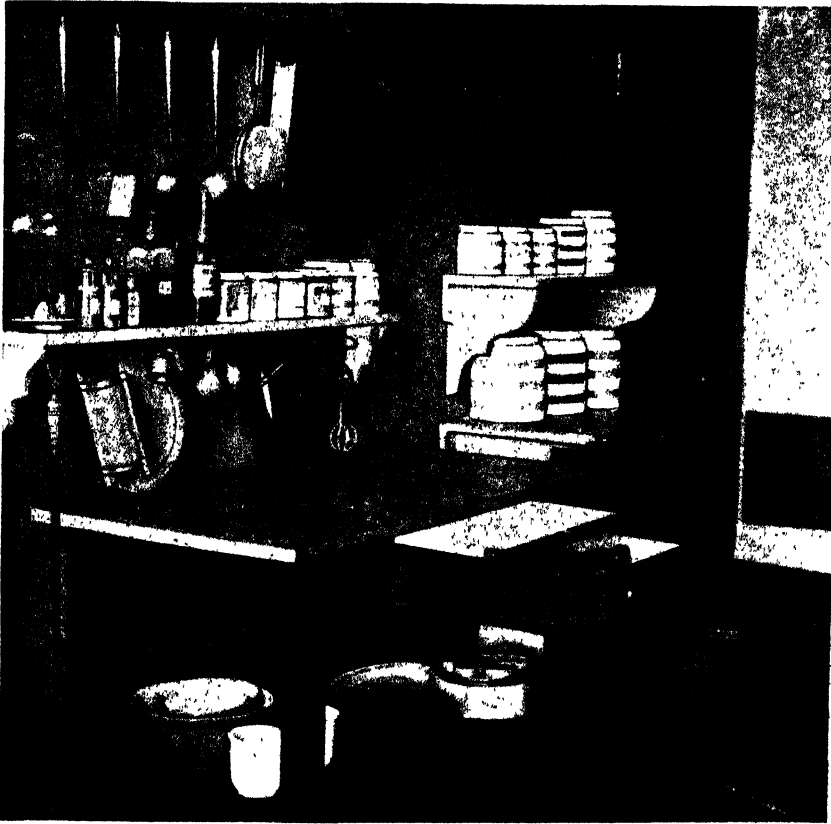


ILLUSTRATION NO. 1—EQUIPMENT AND ARRANGEMENT

food is taken from the larder to the table for preparation; this table should be placed in a good light—in front of the window excellent light is obtained, or if the light falls on the table from the left.

3. *The Stove*—This naturally comes next in order, as food is taken from the preparation table and next cooked.

4. *Small Table*—To the right of the stove a small table is convenient. Food may be dished here and save retracing steps to the preparation table. The food,

the place where they are kept. The sink should have two drain boards—one at the right for dirty dishes, one at the left on which washed dishes are drained. A small table at the right, or a hinged shelf, will do excellently, as there is no “draining” here.

It is often difficult to keep the

wall below a drain board clean, also the end of the sink over which the board fits, on account of the stationary board. This is easily overcome by having the drain board placed on four supports, at the end of which castors are placed; in this way the drain board can be easily moved away from the wall and sink so that they can be cleaned. Further it may be used as a wheel tray on which to move a number of things in the kitchen, thus doing away with carrying and extra walking. One-inch iron

Egg beaters, measuring cup, can opener, cookie cutter, scissors, etc.

4. A shelf underneath table for bowls and other utensils used daily is good.

5. Table with pastry board fitted into table is good.

NOTE:—A kitchen cabinet carries out these ideas, having compartments for flour, sugar, jars for baking powder, etc., and a pastry board fitted into the table.

ILLUSTRATION No. I

This is a plain table, 4 feet long, 2 feet wide, and 3 feet high, fitted with drawer for knives, etc. A pastry board is also fitted into it.

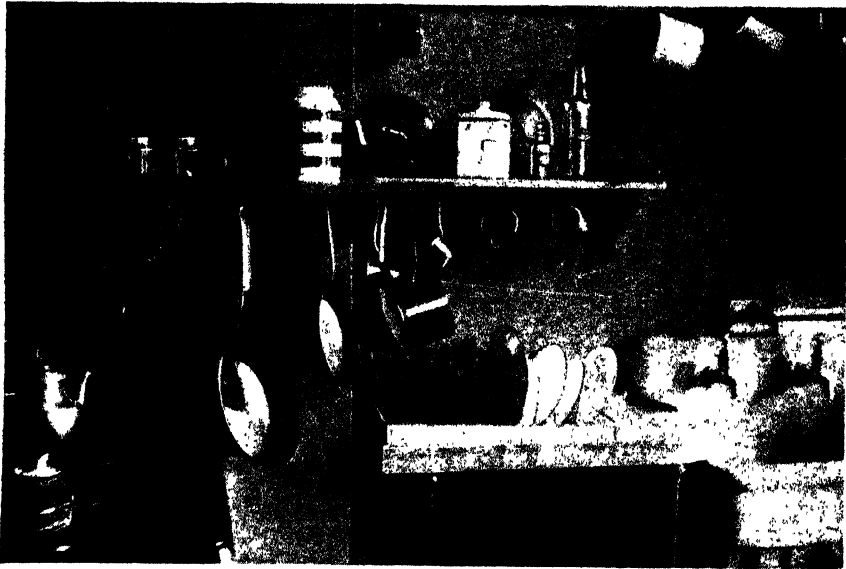


ILLUSTRATION NO. II—POSITION OF STOVE AND SINK

pipng makes good supports for this. Care must be taken to have the board fit over the sink properly.

SMALL EQUIPMENT AND MATERIAL

These should be arranged around the fixture where they are used. The following suggestions may prove helpful:

1. *On shelves to right of table:* Flour, sugar, oatmeal and other cereals, rice, other materials used frequently.

2. *On shelf above table:* Baking powder, flavouring, etc., soda, cream of tartar.

3. Cup hooks on shelf,—on which hang:

The shelf below holds bowls used continually during the day; the spices are here too.

The arrangement of shelf and hooks above table is excellent; everything is at hand and the worker does not have the working space for utensils and such materials as baking powder, etc. To the right shelves for flour, sugar, cereal, etc. Note the width of lower shelf; a large bowl may be placed there and sugar, or whatever is needed, measured into it. The jar does

not have to be carried to the table.

Particular attention is called to the table top. This top is tin covered. Tin or zinc makes an excellent cover for the table—heat does not hurt them and they are easily kept clean and look bright.

Stove—

1. There should be a shelf or shelves by the stove holding salt and pepper and other seasonings used at the stove—also the tea.

2. Hooks underneath shelf for potato masher, etc.

3. If desired some saucepans, etc., might also be hung here.

Sink—

1. A shelf should be near it on which washing soda, etc., are kept.

2. Hooks for measuring cup and various sauce pans, for vegetables. These are prepared at the sink and when the time comes for cooking, the saucepan is at hand into which to put them. Pot lids should be near saucepan.

ILLUSTRATION No. II

1. In this case, stove and sink had to be side by side. (There is a butler's pantry also.)

2. Note saucepan near sink and stove.

3. Note tea, salt and pepper by stove.

4. Potato masher by stove.

5. Sink drainer—Dishes are rinsed out of scalding water and placed in this to dry. Time and labour saved is very marked.

6. Drain board is placed on supports with castors and can be moved from wall.



ILLUSTRATION NO. III—LABOUR AND TIME-SAVING UTENSILS

WORKING HEIGHTS—MRS. CHRISTINE FREDERICK—"THE NEW HOUSEKEEPING"

Height of Woman	Proper Height of Working Surface
4 feet 10 inches	27 inches
4 " 11 "	27 1/2 "
5 " "	28 "
5 " 1 "	28 1/2 "
5 " 2 "	29 "
5 " 3 "	29 1/2 "
5 " 4 "	30 "
5 " 5 "	30 1/2 "
5 " 6 "	31 "
5 " 7 "	31 1/2 "
5 " 8 "	32 "
5 " 9 "	32 1/2 "
5 " 10 "	33 "
5 " 11 "	33 1/2 "

ILLUSTRATION NO. III
Some kitchen utensils which should

be in every kitchen and save both
time and labour:

1. Racquet egg beater	\$0. 15
2. Large Dover egg beater . . . . .	. 20
3. Small Dover egg beater . . . . .	. 10
4. Potato masher . . . . .	. 15
5. Egg lifter . . . . .	. 10
6. Puree strainer and pusher . . . . .	. 25
7. Measuring cup (most necessary) . . . . .	. 10
8. Funnel with sieve . . . . .	. 20
9. Grater . . . . .	. 05
10. Scissors (indispensable) . . . . .	. 40
11. Can opener . . . . .	. 15
12. Food chopper (time, labour and money saver)	2 00
13. Casserole—suitable for custards, various other baked puddings, casserole steak, chicken, etc.	1 50
14. Meat board . . . . .	. 20
15. Double boiler (indispensable) . . . . .	. 25
16. Cake cooler . . . . .	. 10
17. Bread mixer—a great labour saver—useful to those in well-to-do circumstances and very useful for those in poorer—excellent bread is made in it; less labour and time is required; there is also much less handling of the bread.	2 75
18. Cake mixer. This makes excellent cake and where not needed for the poorer family would be a great aid to the household administrator doing her own work.	2 75
19. Potato ricer—though not a necessity, it is a great convenience . . . . .	. 40

SASKATCHEWAN

BY MISS ABBIE DE LURY, DIRECTOR OF HOMEMAKERS' CLUBS

THE kitchen should be airy and fitted up in such a way that it can be kept clean without an excess of labour. It is not well to have it too large, so increasing the amount of work necessary to keep it in good condition and causing an unnecessary amount of walking in the performance of duties. On the other hand it is well not to have it so small that the movements of the housekeeper are cramped and airiness is impossible. There ought to be space enough for the worker in the kitchen to sit down and sew or read, or merely rest. As much as possible should be done to make the kitchen bright and cheerful.

Fittings—(1) Walls—it is well to have the walls and ceiling of a kind that can be easily cleaned and kept free of dust; colours cheery and soft, clean and cool looking. Painted or tinted walls in soft, flat colours answer the purpose very well.

Woodwork—baseboard, cupboards, etc., should be painted in a colour

that harmonizes with the other colour schemes; sometimes it is difficult to get nice soft shades in paint. After being once well painted a fresh coat every spring will usually suffice to keep a surface in good condition. It is easily cleaned by using warm water with a few drops of ammonia in it; soap is hard on paint.

Linoleum has the advantage of being easy on the feet of the worker, also on the whole body because of its yielding qualities; it is easily kept clean, is durable in itself and also preserves the floor underneath; it is warm also.

Furnishings—will always, in large measure, depend on circumstances, whether city conveniences or not, size of family, etc., but in any case, all should be plain and substantial.

The kitchen work table may be either plain white natural wood or may be covered with aluminum, zinc or oil cloth. The zinc and aluminum have the advantage of being durable,

easily kept clean and cannot be injured by heat.

A cupboard of some description is a positive necessity unless a pantry is situated very conveniently to the kitchen. The size and kind will always depend on circumstances—whether there is pantry space, size of family, character of meals, etc. Where there is no pantry and the kitchen is large enough (and it should be large enough in such a case) a cupboard that will answer every purpose can be built in. It will be found just as convenient, if not more

hanging about is, in general, not a good one. There is always a certain amount of unavoidable dust, which, of course, will settle on the exposed utensils so that there is extra cleaning required to make them fit to use.

A chair or stool should stand near the work table. If it is not there, the worker will, in all probability, stand at her work and thus lose many an opportunity of resting.

A small table for work-basket and a rocker near a window should be a part of the furnishings.

Hangings are not appropriate in

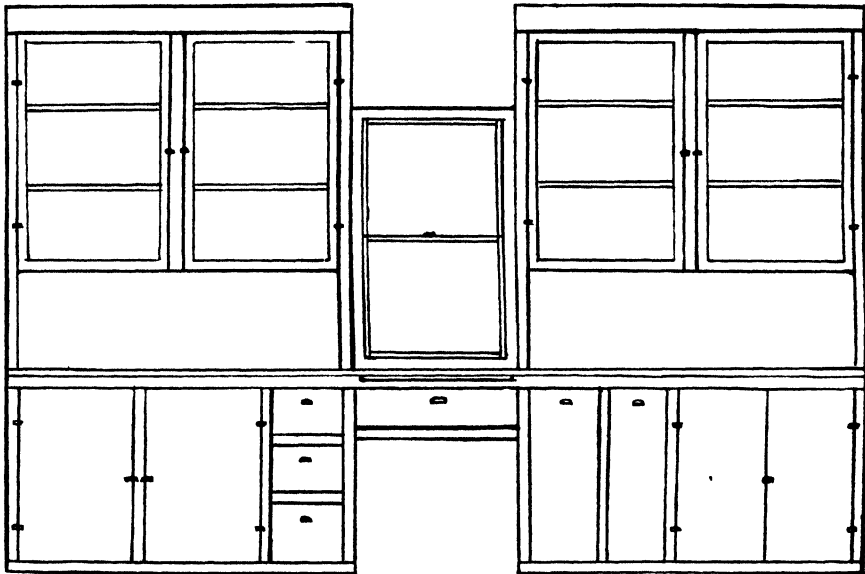


FIG. 1—PLAN OF A BUILT-IN-KITCHEN CUPBOARD

so, than a pantry and assuredly will take less trouble to keep in order. Fig. 1 illustrates such a cupboard. It allows for space above for dishes and below for utensils and supplies. There are drawers for knives, towels, cloths, etc., a bakeboard and table space for working and serving. The window in the middle provides for good light. A division for writing, keeping accounts, books, etc., could be made.

UTENSILS AND THEIR CARE

The practice of keeping utensils

the kitchen, but plain, simple muslin or cheese cloth curtains for the windows are not objectionable.

A table-wagon is a great saver of time and energy. One can easily be made at home by using perhaps an old bed-room table or other small table and putting it upon castors. Slats can be nailed around the edge of the top to prevent dishes sliding; it may also be fitted with an extra shelf below.

A small cupboard for cleaning materials should be in a convenient place. A small one can be set up

over the sink, and all materials, tools and utensils used for household cleaning kept in it, also materials used for keeping the hands in condition. A cupboard reaching to the floor could be used for hanging brooms, brushes, etc., pails, cloths and other things used in house-cleaning. Such a cupboard could occupy a corner close to the sink.

A coal-oil stove with an oven and with a sufficient number of burners

from the standpoints of convenience, economy and proper serving of some kinds of food.

A covered garbage-can should be kept outside the kitchen, if possible. An uncovered can should be looked upon with horror as a breeding-place for flies.

Utensils—These should be of the best quality and it pays to buy such. In general, enamel and granite are the most satisfactory ware within

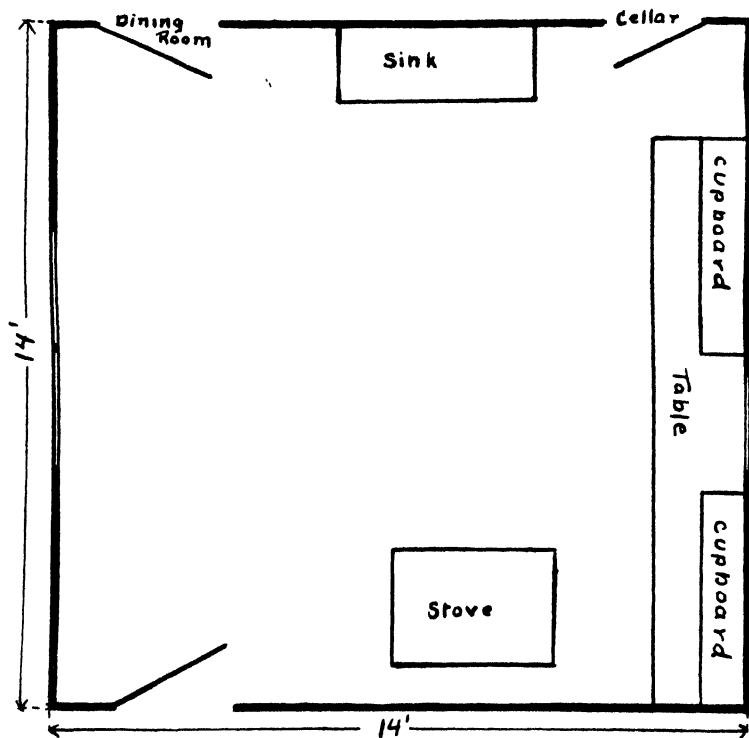


FIG. 2—PLAN OF KITCHEN BUILT AS A REAR ATTACHMENT TO THE HOUSE

can save a great deal of labour and discomfort during the summer, especially if the farm kitchen has to serve as dining-room also.

The fireless cooker is a splendid adjunct to a coal-oil stove, as many processes begun on the stove can be finished in the cooker while the stove is perhaps being used for other things.

A cold closet of some kind, which is an easy thing for everyone to have, should be looked upon as a necessity

the reach of all, but only the best should be purchased. Aluminum is durable, light to handle and easy to heat. It is expensive at first but lasts so well with care that it is cheap in the end.

It is not wise to have an overstock of implements to work with; they are often unnecessarily brought down, adding to the work of dish-washing and there are always that many more to handle and put away.

ARTICLES THAT ARE NEEDED

The following is a list of articles that are needful in any average household. The list can be added to or some articles eliminated to suit particular cases. Choose articles that are easily kept clean and in repair, avoid utensils with seams, and use one of each of the following: granite dish pan, rinsing pan, tea-kettle, large stew-kettle with lid, roasting pan, double boiler, large lipped saucepan with lid, medium saucepan, three-quart granite pit-

board, rolling pin, jelly mould, kneading pan, fibre pail, granite soap dish, wooden chopping bowl, chopping knife, set jelly cake tins, dover egg beater, can opener, cork screw, French knife, spatula, paring knives, scales, meat grinder, tin measuring cups, vegetable brush, bread knife; use two of each of the following: large pie plates (tin), loaf tins, asbestos mats, wooden spoons, paring knives, tin measuring cups; use three imitation silver tablespoons, and three forks (nickel), 1 dozen

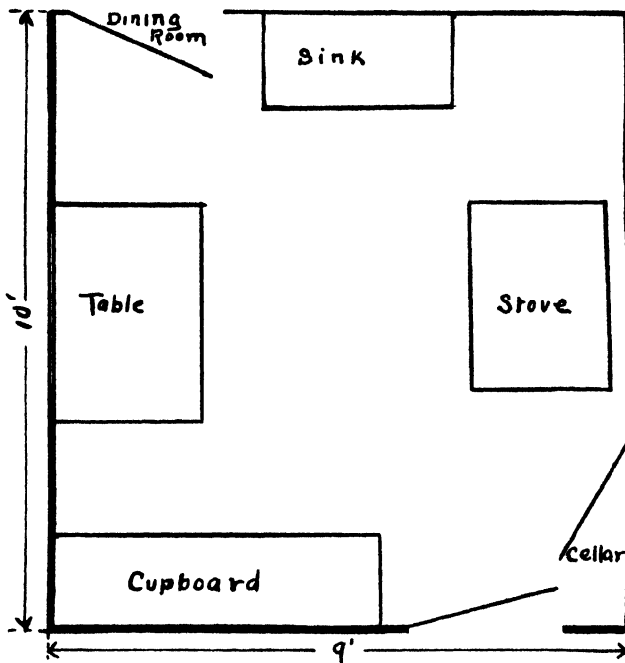


FIG. 3.—PLAN OF KITCHEN BUILT INTO THE BODY OF THE HOUSE AND WHERE ONLY ONE WINDOW IS AVAILABLE

cher, one-quart granite pitcher, large pudding dish, medium pudding dish, steamer, muffin tin, large earthen mixing bowl, granite colander, potato masher (wire), potato ricer, flour sifter, coarse wire strainer, fine wire strainer, vegetable grater, nutmeg grater, granite funnel, tin skimmer, biscuit cutter, lemon squeezer (glass), pair salt and peppers, meat board, round cake-tin, square cake-tin, frying pan, meat

earthen cups, and $\frac{1}{2}$ dozen imitation silver teaspoons.

Arrangement.—There are two types of kitchen which seem to be the most general: (1) the usually rather small kitchen built into the body of the house, (2) the kitchen built as a rear attachment to the house.

The latter is, of course, to be preferred on account of its lending itself to easy ventilation and plenty

of light and sunshine can be obtained; also, (its comparative isolation from the living-rooms, from which kitchen odours can be more easily kept, is another advantage).

Figure 2, illustrates a plan for a kitchen of the former class, where usually only one window is possible. In the plan given the table is placed

removed from the stove. The sink is placed so that it is convenient to both dining-room and cupboard. The stove is placed near the cupboard and is where it is not exposed to draughts if windows are opened.

If the kitchen has to be used as dining-room as sometimes happens, the plan given in Figure 3 on a larger

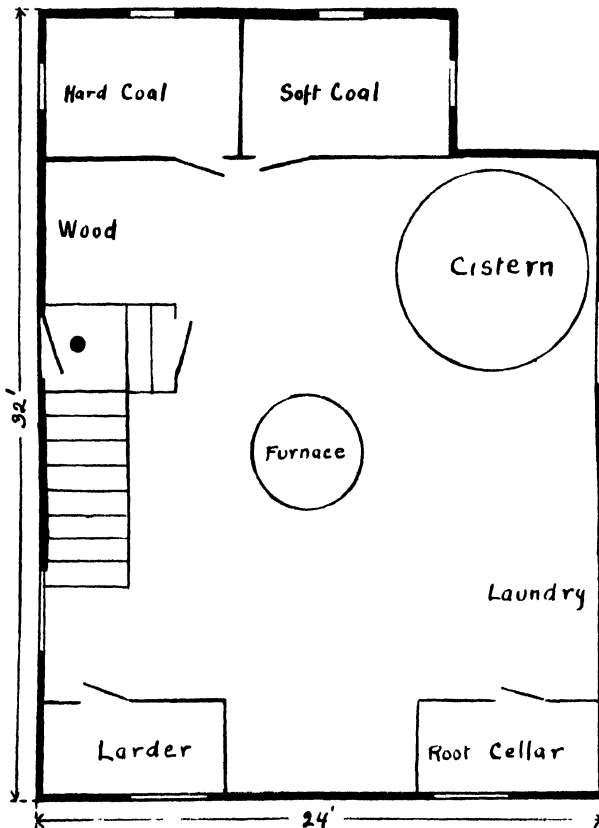


FIG. 4—BASEMENT PLAN WHICH SHOULD BE AN ADJUNCT TO THE KITCHEN

under the window to give good light while working.

Figure 3, is a plan for built-in kitchen. It contains a cupboard of the kind illustrated in Figure 1, and so renders pantry unnecessary. The side of the kitchen opposite the cupboard allows for a very wide window and on that side is sufficient room for a table and chair well

scale would be suitable, the dining-table placed near the window on the left side.

It is wise to avoid extra additions in the way of sheds built on to the house, in as far as possible. Such places are liable to become littered with all sorts of odds and ends and often make a lot of unnecessary work in keeping them clean and tidy.

BRITISH COLUMBIA

BY ALICE RAVENHILL, F.R.SAN.I., MEMBER, ADVISORY BOARD, WOMEN'S INSTITUTES OF BRITISH COLUMBIA, LATE LECTURER ON HYGIENE, UNIVERSITY OF LONDON, KING'S COLLEGE FOR WOMEN

THE majority of women have to make the best of the kitchens built in houses where they reside; as this is my own case, it seems to me most helpful to describe my own kitchen, showing how convenient it has been made by means of thought, as proved by the test of several years daily use, and pointing out where improvements should be made when funds permit the expenditure.

A kitchen should always occupy one corner of a house, preferably the north-east corner, because:

(1) With windows in the north and east walls abundant light is provided, without necessity of cutting off the invaluable top light by opaque shades. Also, necessary cross ventilation is easy of arrangement, by keeping these windows open.

(2) With two outside walls a verandah can be provided to one or the other, and access to a verandah, preferably to the north, is a desirable part of kitchen equipment.

(3) An eastern aspect is cheerful in the early morning all the year; but is also cool in summer afternoons, when fruit preserving involves use of the kitchen.

(4) The larder should, if possible, be on the north, outside the house, yet of easy access from the kitchen; a north verandah meets the need. Figure (1) shows such a larder, made of four fly proof doors, carefully fitted together, with four capacious shelves; raised from the floor level in consideration of cleanliness, while air circulates freely through and around every part. A coat of creosote each spring keeps all in good order. In summer, it is supplemented by a simply made "iceless refrigerator", 2 feet by 2 feet, by 1 foot, 6 inches, with two shelves

made on the same plan, but closely covered with thin flannel. The top is flat; on this stands a pail of water, 8 or 10 two-inch strips of flannel connect the water in the pail with the cover, which is thus kept constantly damp. Rapid evaporation is the result, so that the interior temperature is from 15° to 20° below that of the outside atmosphere.

Attached to the outside wall of the house, 3 feet from the floor of the verandah, are three wire bins, 1 foot, 8 inches by 1 foot, 3 inches. These hold a sufficient "current" supply of potatoes, onion and root vegetables. Suspended from two strong hooks, screwed into the wall a little further from the door on to the verandah, is a sack, to receive broken crockery or glass, empty cans and so forth. Above are clips for broom and floor mop, also hooks for the pans kept for parlour "washing up" of silver and china. A narrow shelf holds the knife cleaner, and a similar shelf, close to the larder, is convenient when carrying food to and fro.

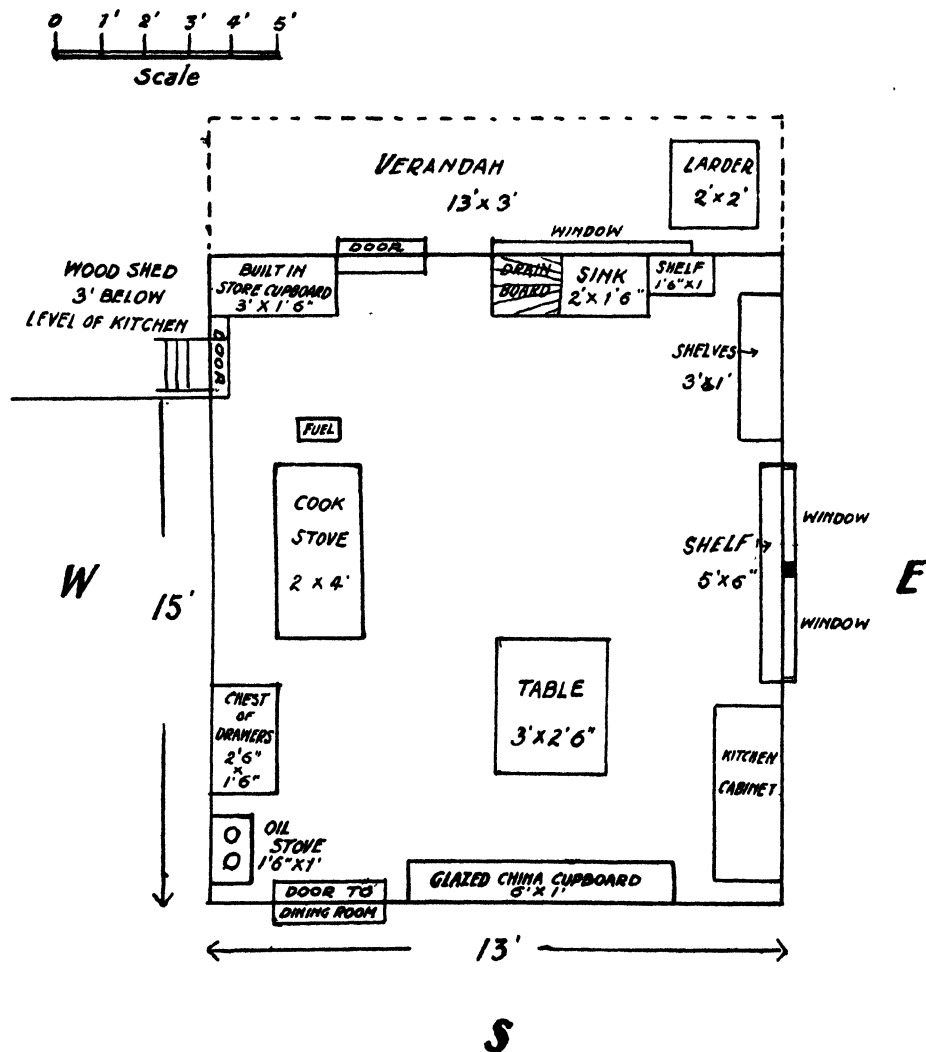
The walls of this kitchen are well oiled hard wood, supplemented by white, lightly patterned, linoleum, nailed for some feet on each side of the sink and behind the kitchen stove. When funds permit the walls will be covered all round the room with white oilcloth, 7 feet high; held in place with light laths; this is an ideal surface to keep clean. The floor is covered with carefully fitted cork lino, endless in wear, warm to the feet (which means much to health and comfort) and quite easy to clean by sweeping and the use of a mop, with coal oil, two or three times a week.

The kitchen is lighted by three large windows; no shades are necessary; the more light the better for the

quality of the work done and the spirits of the worker. Only in severe frost are these windows closed, night or day.

Artificial light is afforded by a 50 c.p. oil lamp, to be superseded by gas when funds permit.

middle of the west wall, as the house was wisely built with a central chimney stack, to conserve the warmth. It measures, 2 feet wide by 2 feet, 6 inches high, by 4 feet long, and is found of sufficient size for a family of five or six. It stands out



GROUND-PLAN OF KITCHEN

The ground plan and Figure (2) give a general idea of the arrangement and equipment of the kitchen.

The cook stove is fixed about the

fifteen inches from the wall, which allows cloths to be suspended behind, to be dried in wet weather, and affords a place, free from draught,

for the bread pan when the dough is rising. The 40 gallon hot water cylinder attached is fixed in the bath room next to the kitchen. Beside the stove, just within the door through which the wood is brought, is the basket for fuel, raised on a

strainer, fish drainer, etc., ready to the cook's hand. On the other side of the stove is a small chest of drawers, full of cloths, cheese cloth, ironing blanket, etc. It may be mentioned here that all washing is done in the laundry, equipped with



FIG. 1—THE LARDER SHOULD BE OF EASY ACCESS FROM THE KITCHEN

stand to a level with the fire box; this is a great saving when making up the fire.

Above this basket, hung on hooks to the linoleum covered wall, are the frying pans, egg poacher, gravy

washing machine, and ironer; only small fine things are ever ironed in the kitchen.

Above this chest of drawers run three shelves used for pudding bowls, bread and cake tins, dish

drainer, etc.; while the egg whisk, peel grater, meat saw, chopper, strainers and colander hang from hooks at the edge of the shelves.

The cooking table (2 feet, 8 inches from the ground), stands in this part of the room, between stove and kitchen cabinet; thus the articles on these shelves are handy for processes carried on at the table, the top of which measures 3 feet by 2 feet, 6 inches, and possesses an invaluable half-moon-shaped leaf, which slides under the table when

coffee trays on hooks, and in front of them stands the wheel tray, home made.

A high, light stool (2 feet, 4 inches) is kept under the table, to be used as a welcome support when peeling fruit or vegetables or carrying on other preparatory processes.

Two large windows occupy the middle of the east wall; these should have been at least 12 inches higher from the floor; cake and bread mixers, crumb grater, food chopper, apple peeler, etc., could then have



FIG. 2—A WELL ARRANGED KITCHEN

not wanted and adds materially to its size when occasion requires.

A blue flame oil stove is tucked in between the chest of drawers and the end of the room; and above, on one of the three shelves just mentioned, is the useful stove, on which a quart kettle will boil in a very few minutes, and is always used for preparation of breakfast.

The south end of the kitchen is occupied chiefly by a 6-foot glass fronted cupboard, with sliding doors, close to the door into the dining room; beneath hang the tea and

been screwed permanently to the shelf; now, these conveniences have to be kept in a cupboard and screwed to the table when used.

To the right is an invaluable possession, a thoroughly satisfactory kitchen cabinet; the shelves are easy to clean, because coated with white enamel; they are of a height and width which allow them to be filled with jars, bottles and tins of ordinary and useful sizes and capacity. They are also long enough to accommodate a sufficiency of all the ordinary cereals (rice, sago, oatmeal,

etc.) and tins of raisins, peel, flavourings, pickles, sauces, spices, herbs, nuts and so forth.

Two bins below the shelves hold 15 lb. respectively of granulated and demarara sugar, and closely fitting metal drawers can be utilized for ginger, pepper, soda, etc. Necessary domestic drugs are secure in a cupboard under lock and key, while paper bags for cooking, lamp wicks, paper doyleys, etc., find homes in three central drawers.

The flour bin below the zinc covered shelf stores 50 lb.; and a week's supply of bread can be kept fresh in the well, ventilated metal receptacle, on the corresponding

constant stooping; otherwise the position proves convenient. The window above ensures light and air; space permits of the desirable shelf for washbowls, from which hang, suspended by small rings, brushes, mops, soap saver, plate scraper, etc. To the right is the portable, airy, metal saucepan-stand, with a semaphore for the kitchen cloths when brought in from the line.

A pan under the sink receives vegetable parings, etc.; neatly arranged on the shelf to the right are all the cleansing and repairing agents in use by this household, soda, ammonia, soap, jelly, soap powder, salt, whiting, turpentine, linseed oil,

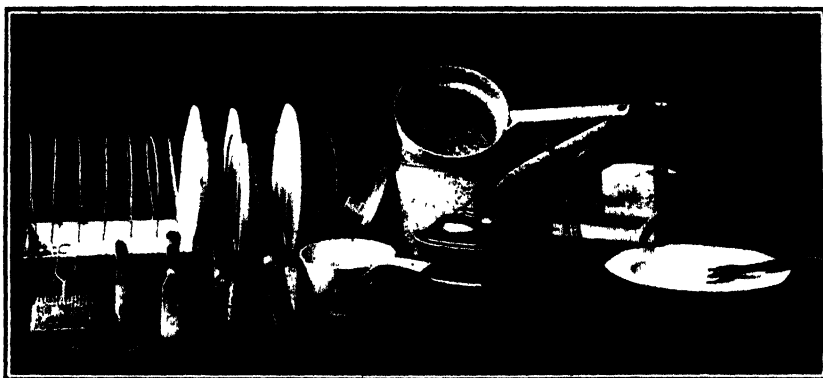


FIG. 3—A GROUP OF USEFUL UTENSILS

fitting on the opposite side. Both bin and bread cupboard are on rollers, so are moved with a minimum of effort. A deep cupboard, with sliding shelf, fills the space between, and is convenient for the storage of a supply of marmalade, preserves and syrups for daily use. Above is a drawer divided into compartments for kitchen knives, string, and other sundries; chopping and pastry boards are slid beneath the zinc covered surface of the table portion of the cabinet, which can be extended on each side by hinged flaps.

The sink, fixed in the north wall of the room, is faulty, because fitted 6 or 7 inches too low, thus obliging

cement, glue, formalin, etc.

Above are the kettles in constant use, the quart and pint measures (the household scales stand on the kitchen cabinet), tea and coffee pots, etc. Above again are pans and kettles only occasionally used, while, on the top shelf are the pestle and mortar, the thermos flask in its case, and other such articles.

Beneath these shelves stands the fireless cooker, one with three compartments, though experience shows two would suffice.

With respect to equipment there will always be divergencies of opinion. My own experience has taught me that to have a series of

china bowls, varying from two to six inches in diameter, makes for convenience and saves the labour of washing a vessel unnecessarily large for the contents. The same remark applies to saucepans, to cake tins, and to kettles; three kettles of different sizes make for economy, also in fuel and of water. Similarly, the metal covers for pudding basins, known as the "Queen" pudding boilers, save the tiresome job of washing pudding cloths, prevent the risk of water boiling into the basin, as when covered only with greased paper, and make for true cleanliness. The perforated cylinder "College" pudding boilers made for rolled puddings, meat rolls, etc., are not, unfortunately, to be had on this continent; they are a great convenience and aid to cleanliness and efficiency.

Household scales, a cooking thermometer, and a plate or dish drainer are indispensable to accuracy, which means success, thrift; and the practice of true cleanliness; plates washed first in a soapy lather, rinsed in really boiling water and drained, are as clean as human care can make them, while that questionable clean article, the dishcloth, is unnecessary—a dual saving of time and an increase of efficiency. Bread and cake mixers wear indefinitely and save hours of labour; the "Improved Economy" colander supersedes sieves and renders soups, fruit jellies, vegetable purées, etc., possible in busy homes, so rapid and efficiently does it work. Food choppers are fairly common, but graters on the same principle for crumbs, cheese, peel, etc., should find a place in every kitchen. Three small conveniences, costing but a few cents, are the soap saver or shaker, the plate scraper and the perforated aluminum fitting, which fixes into any bottle, for sprinkling linen before ironing or the surface of dough

which threatens to dry. One or more flexible spatulas for clearing out bowls, loosening cakes from tins, or other such uses, are effective and of real assistance; they may rank beside a long handled dustpan or a long handled scrub brush, as aids to efficiency and time and labour savers.

Nearly all the utensils in my kitchen are aluminum; their wear is apparently endless; they clean easily with soap and water and an occasional dose of Bon Ami; they never rust and always look nice.

A steam cooker of some make I look upon as a necessity in the interests of health as well as of economy of labour. The Ideal steam cookers exemplify their name, for in addition to steaming many kinds of food at the same time, they sterilize fruit jars admirably, and thus serve a double purpose. The same comment may be made on the much more expensive Steam Pressure cooker, my last acquisition; its use reduces the fatigues of fruit preserving to a minimum; besides which, so rapidly and effectively can food be cooked by this means, that the preparation of a meal, in which carrots, beets, potatoes, meat, etc., play their part, can be postponed until an hour before time for serving. Carrots can be cooked in 6 minutes, for instance.

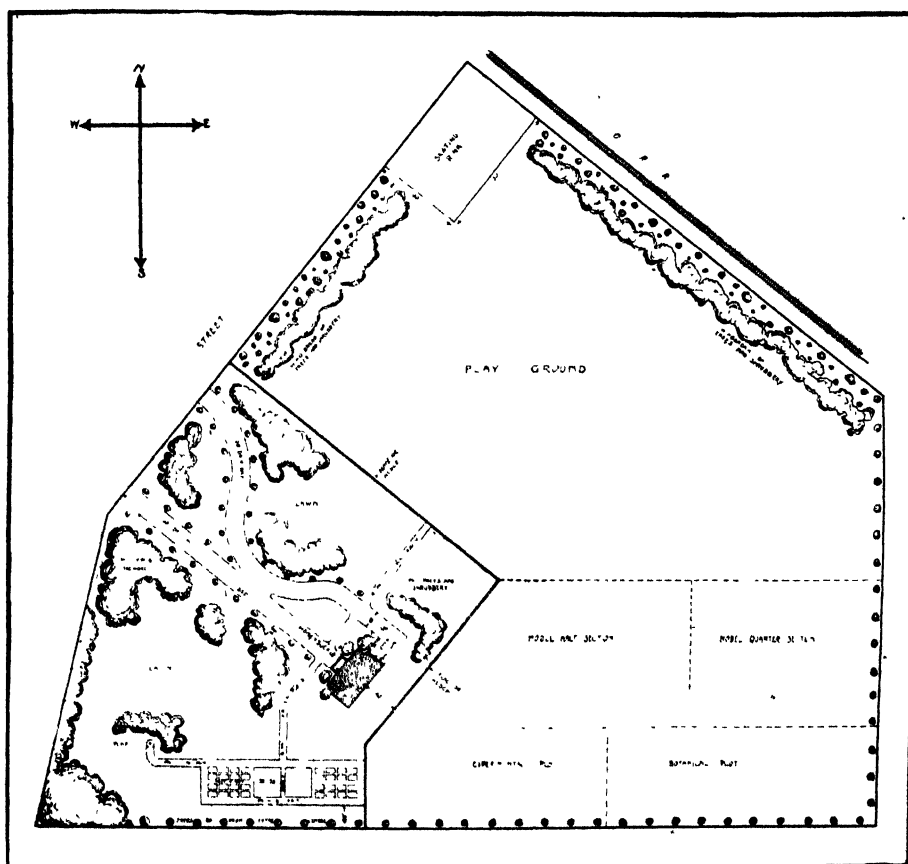
The high stool for support, the wheel tray for transport of food and dishes, are also necessities of kitchen equipment; like the fireless cooker, both can be home-made at small expenditure on materials, but with incalculable gain to the housewife. Simplicity in shape and in decoration should be the guiding principles in the choice of china for table service, and a wise investment is the purchase of as many fire-proof china dishes as the purse will permit; for in these food can be cooked as well as served.

A RURAL SCHOOL WITH TEN-ACRE GROUNDS

BY A. W. COCKS, B.Sc., DIRECTOR OF SCHOOL AGRICULTURE, SASKATCHEWAN

THE accompanying plan represents a school site of ten acres which is being purchased by the board of Creelman S.D. No. 998. A good two-roomed brick school was built in 1915 according to a plan which appeared in

garden with individual plots and community plots is shown to the south-west of the school building. The remainder of the south-west portion of the grounds will be devoted to shrubberies, lawns, drives and walks. Flower gardens have not been in-



PLAN OF SCHOOL GROUNDS, CREELMAN, SASK.

the August number (1915) of THE AGRICULTURAL GAZETTE, page 803.

All of the ten acres was summer-fallowed in 1915 in preparation for planting the trees and shrubs as indicated on the plan. The school

indicated on the plan but no doubt will make their appearance on the ground in due course.

It is the intention of the board to use the south-eastern portion of the grounds for agricultural purposes.

Experiments and demonstrations in different methods of cultivation, rotation of crops, etc., will be conducted on the model half-section, model quarter-section and experimental plots. The remainder of the ground will be used as a playground, while the whole will be protected from the north and west by a windbreak of trees and shrubs.

At the present time only the work prescribed for the elementary school is being conducted at Creelman, but

the Board expects to extend the influence of the institution until it becomes the educational centre of the community. At that time it is possible that a larger building will be required and that even better use will be made of the land attached to the school than is now proposed.

It will be understood, of course, that the accompanying plan is one which is liable to alteration as the need for changes are discovered in the actual laying out of the grounds.

THE IDEAL RURAL SCHOOL

IN a pamphlet issued by the Department of Education of Saskatchewan to stir up the public mind on the desirability and method of public school reform, the ideal rural school is described as follows:

"We hope that many rural schools will be established in Saskatchewan where the buildings will be surrounded by ample gardens and playgrounds which will be suitable for or adjacent to public picnic grounds. There will be plenty of windbreaks and other shade trees. On one corner of the property will stand the teacher's residence, which, in many cases, will be also the local post office. There will be outdoor workshops and, of course, proper stabling. The playgrounds will be supplied with swings, sand piles, and other simple and useful apparatus for outdoor gymnastics and games, and the play will be properly supervised.

"In this school all the children of school age in the community will be enrolled and in regular attendance, and many older boys and girls and adults also will be encouraged to study there whenever they can. The school will have the "atmosphere" of a happy, healthy, self-respecting farming community. Much less book work will be done than is now expected, but it will be done much better. The healthier bodies and clearer brains of the students, with the curriculum most carefully adapted to the future man and woman in their activities, will contribute much to more efficient scholarship in mathematics, history, grammar, and every other study. In the afternoons much of the study will be done in the open air, when the occupations of the pupils will be chiefly handwork and the like. The teachers and children will eat their noonday meal together, like

civilized and Christian people, and it will include regularly at least one warm dish prepared in connection with the training in domestic arts. No pupils with defective eyes and teeth will suffer through neglect. No pupil will have a task too great for successful accomplishment; and everyone will be encouraged to put his whole energy into the task or sport proper to the hour.

"The school building itself will be attractive in appearance and properly heated and ventilated. It will have verandahs on two sides. Over the door will be the name and a brief motto expressive of the essential purpose the school is intended to serve. The present absurd rows of immovable and unadjustable seats will be replaced by furniture devised and manufactured to meet the special needs of rural communities in Saskatchewan, and thus will be adapted for use by fraternal societies, religious bodies, and other assemblies of adults. There will be far more window space than would be necessary in latitudes where the winter days are longer and brighter than here. Of course, the public reading room for the community, with copies of the most popular and excellent newspapers and magazines, as well as the public library, will be found in the school building. It will also contain varied apparatus for wholesome indoor games. In short, everything practicable will be done to make the school a suitable place for the citizens of the rural community to meet in the evening, or other leisure hours, for self-improvement, and the enjoyment of social intercourse. There will be a public telephone, some such instrument as a Victrola, and a magic lantern. One special use of the latter will be in connection with public lectures. The teacher will be a real rural expert, a settled resident of the community, happy in the present and looking forward to a rural superintendency to crown his career."

PART IV

Special Contributions, Reports of Agricultural Organizations, Notes and Publications

THE UNUSUAL RAINFALL

MEMORANDUM BY SIR ROBERT F. STUPART, DIRECTOR OF METEOROLOGICAL SERVICE FOR CANADA

THERE have been so many enquiries as to the cause of the unusual rainfall of April, May and June, coupled with the suggestion that it may have resulted from the heavy gun-fire in Europe, that the writer wishes to bring his views to the attention of the public.

Among the more notable investigations of the climate of past centuries are those by Professor Huntington, and his conclusions are based on historical records in Europe, archaeological investigation in Central America, and on the tree growth as indicated by the rings of old trees, especially the Sequoia of California. The curves showing probably rainfall which he has obtained from these various sources, show a fairly satisfactory agreement through the past 3,000 years, and indicate that the weather conditions throughout this long span of human history have been pulsatory in character, periods of wet years alternating irregularly with periods of relatively dry years. Professor Huntington thinks that in the 1,000 years B.C., the weather in latitudes of Syria and the extra tropics of North America was moister than in all later times, and he in common with meteorologists, attributes all the pulsation to variations in the general atmospheric circulation, which variations in turn probably result from variations in solar radiation.

In the past 100 years there have been exceptionally wet seasons and exceptionally dry seasons, also exceptionally cool summers and exceptionally warm summers. Early in the 19th century there were several

exceedingly cool years in eastern Canada and the United States, notably 1812, 1815 and 1816, and 1812 and 1816 were known as years without a summer.

While the rainfall from April 1st to late in June was in excess of the rainfall of the corresponding period in any year since records have been kept in Toronto, there are three May-July periods and five July-August periods when the rainfall was considerably greater than it was in April, May and June.

The excessive rain was only in Ontario and western Quebec. In eastern Quebec and the Maritime Provinces the fall was about an average, while in Newfoundland, the rainfall was comparatively light, and for two months the weather was exceptionally fine and bright.

The writer is of the opinion that the cannonading in Europe has no appreciable effect on the weather, unless in the immediate vicinity, and is negligible in the gigantic working of nature.

The variations in rainfall from year to year through long periods are connected with the general circulation of the earth's atmosphere, which is without doubt affected by changes in solar radiation, which is also variable. Professor Abbott of Mount Wilson Observatory has shown that the sun is a variable star—changing its output of energy by at least one-seventh of the whole. We do not know what the changes have been in by-gone times.

The sequence probably is—a solar change affecting first the equatorial regions, and leading to changes in the strength of the trade wind and the ocean currents and a little later the wind circulation and cyclonic formations of the middle and higher latitudes.

THE AGRICULTURAL COLLEGE LIBRARY AND ITS OPPORTUNITY

BY MRS. H. W. SMITH, WIFE OF PROFESSOR H. W. SMITH, OF THE COLLEGE OF AGRICULTURE, TRURO, NOVA SCOTIA

AGRICULTURAL colleges are the outcome of a persistent demand for an education more suited to an age of progress than the classical form formerly in use. They are now established institutions and are spreading a knowledge of agricultural science. Not content with developing a workable system of inside teaching they have endeavoured to extend their services to the remotest country community by sending out travelling missionaries of agricultural education. Established primarily for the technical instruction of the farmer they are now carrying the work into the home through their courses in home economics. The moving cause of all this activity is the desire to bring opportunities for education to every man, woman and child in the country.

In all this work looking toward the betterment of rural life the book is an important factor. Student and teacher alike require the guidance and help from the recorded experiences of others. A collection of books, periodicals, pamphlets and bulletins classified and catalogued and made immediately accessible is a very essential part of the college.

The universal recognition of the importance of the intelligent use of books has resulted in a world-wide movement to make books accessible to all the people and to stimulate and create a demand for them. In the United States and nearly all the provinces of Canada laws have been enacted establishing libraries and giving every assistance and encouragement to carry on this phase of popular education. With an aggressive policy they are supplanting the passive libraries familiar a generation ago.

With the purpose of a better equipment for the duties of citizenship, thirty-five states of the Union are carrying on library extension work through various agencies, and thirty states have a system of travelling libraries. The province of Ontario with its tremendous area counts a library for every

6,800 of its inhabitants and has travelling libraries of 17,000 volumes. In Saskatchewan when they had travelling libraries in operation but a few months 65 cases had been sent out with applications for 150. From every locality where library privileges have been extended comes the cry for more.

In view of this wide-spread demand on the part of the public for information useful in their daily occupations it becomes not only the opportunity of the agricultural college but its duty—supported as it is by public taxation—to extend its library privileges to the remotest hamlet of its constituency. Just as the college has reached out to the farmer through its practical demonstration of improved methods of work it should have literature on those subjects immediately available to him. A lecture that has been listened to may soon be forgotten, whereas, if it had been followed by reading on the subject, more permanent good would be accomplished. Such literature as the farmer is likely to have is mainly in blue books and of a technical nature and not always stimulating. To get such information as he may require usually necessitates a letter to a Department of Agriculture or a college. Oftentimes he is too busy to make the effort and becomes indifferent. This is a lost opportunity of the college to fulfill its obligations to those to whom it makes its direct appeal.

There are various agencies by which the library extension may be put into operation—co-operating with the short course, farmers' institutes, lecturers on agricultural education, women's institutes—to create an interest and demand for the books and through travelling libraries.

For those colleges located where there is no provincial library legislation, there is surely a field of great opportunity for enlarging their scope for usefulness. The most isolated fishing village could share in its best.

NEW PUBLICATIONS

THE DOMINION DEPARTMENT OF
AGRICULTURE

THE FRUIT BRANCH

Fruit Crop Report No. 2, July, 1916, gives fruit conditions in June and the prospects. Relative to apples, scab is reported in Ontario and Quebec, but the Annapolis Valley promises well. Good crops are likely in New Brunswick and Prince Edward Island. British Columbia prospects are reported fair. Raspberries, poor elsewhere, were exceptionally promising. The cherry crop was generally light. Plum prospects varied greatly, Ontario promising a medium crop, Quebec an average crop, British Columbia a fair crop, and Nova Scotia a good crop. Leaf curl was reducing the Niagara peach crop.

THE PROVINCIAL DEPARTMENTS OF
AGRICULTURE

ONTARIO

The Live Stock Branch. The report for 1914 and 1915 of this Branch makes a blue book of 104 pages. It contains the addresses delivered at The Ontario Provincial Winter Fair, Guelph, in 1915; the financial statements of the fair for 1913, 1914 and 1915; the financial statements and lists of officers of the various breed associations and a report of the co-operative shipment of live stock. A great deal of valuable information relative to the operations, not only of the Ontario Department of Agriculture, but also of the other agricultural departments, the federal, as well as the different provincial, is embodied in the addresses. Marketing and transportation are informatively dealt with.

Potatoes, by C. A. Zavitz, B.S.A., LL.D., Professor of Field Husbandry and Director of Field Experiments. According to this bulletin, which is dated May, 1916, and numbered 239, the production of potatoes in Ontario is about equal to the combined production of the three Maritime Provinces and somewhat greater than the combined production of the four Western Provinces. Potatoes are grown in every county of Ontario, Simcoe being the premier county, producing an annual average for the years of 1910 to 1914 of 1,133,900 bushels, while Dufferin came in last with 503,297 bushels. Dr. Zavitz says himself that the chief aim in writing the bulletin was to present the results of experiments and of investigations with potatoes carried out at the Ontario Agricultural College and throughout the province within the past twenty-six years. He also says that the information furnished should be of real value to potato growers in their endeavour to improve both the quantity and the quality of the potato crops

of Ontario. With this it is not difficult to agree, for the 88 pages, of which the Bulletin consists, are replete with just such information as will bear thorough digestion by the potato grower, who besides plentiful details on cultivation and varieties is supplied with remedies for many of the diseases to which the potato is subject. Many descriptive illustrations add to the value of the bulletin, which, it is hardly necessary to say, although written primarily for Ontario, contains much of interest for the potato grower in any part of the Dominion.

Ontario Bee-Keepers' Association, Thirty-sixth Annual Report, 1915. Much of an exceedingly practical and knowledgeable nature is contained in the 92 pages of this report. The addresses given at the annual meeting of the association held at Toronto in November, 1915, which are published verbatim, were by the leading experts of the Dominion as well as of the province and were of an instructive and illuminative character, which was emphasized by the discussions that followed. A prominent outside speaker was Dr. E. F. Phillips, in charge of Bee Culture Investigation, of the United States Department of Agriculture, who delivered a learned and extensive treatise on "Temperature and Humidity in the Hive in Winter." Bee-Keepers will find the report well worthy of study.

Ontario Agricultural College and Experimental Farms, forty-first annual report, 1915. From this report it is gathered that, owing to the war, the general attendance has fallen off 25 per cent. Two hundred students or graduates have joined the colours. Several members of the staff have also gone. The establishment of the new course, "The School of Rural Leadership," is noted and the fact stated that its repetition was requested. Owing to the success of the other short courses a separate calendar is published. These courses and the number attending are: stock and seed judging, 190; poultry-raising, 34; fruit growing, 55; bee-keeping, 39, and dairying, 121; total, 439. The aggregate attendance at the College was 1,652, including 634 attending the domestic science classes in the Macdonald Institute. Besides details of many experiments and results of investigations and dairy herd records, the report gives the usual particulars regarding the students attending and the individual successes achieved.

Bacterial Diseases of Vegetables Found in Ontario, by D. H. Jones, B.S.A., Professor of Bacteriology at the Ontario Agricultural College. Particulars and descriptions are

given with illustrations in this 28-page bulletin, numbered 240, of bacterial soft rot of vegetables, black leg of potatoes, black rot of cabbage, bacterial wilt of cucurbits and bacteriosis of beans. A high-powered magnifying glass is necessary to reveal bacteria that, infinitesimal in size, yet do an untold amount of damage. Professor Jones describes the resultant destruction minutely and in language that all can understand. He deals, too, fully with methods of eradication and remedy. The bulletin is a timely one that can be profitably studied not only by agriculturists in Ontario, but by vegetable growers resident far from the boundaries of that province.

SASKATCHEWAN

The School Garden. Such is the title of School Agriculture Circular No. 6, of the provincial Department of Education. As the introduction to this admirable exposition of a very live subject says "One of the most noticeable changes during the past twenty years has been the increasingly important place given to nature study on the school curriculum." Other suggestions are that the study of agriculture will be useless without some form of expression, that the importance of the place of the school garden in the teaching of nature study and agriculture can scarcely be over emphasized, and that a well-kept school garden re-acts on the whole community. The circular proceeds in several chapters to deal with the requirements of the school garden from planning to complete consummation. Reference is made to a number of kindred subjects, such as home projects, winter projects, nature study projects and so on. In an appendix, tables are given of vegetables and flowers with their characteristics suitable for Saskatchewan.

BRITISH COLUMBIA

Noxious Weeds, their Identification and Eradication, by H. O. English, Soil and Crop Instructor; Circular-Bulletin No. 18. A list of noxious weeds is followed by instructions for control, identification and eradication. A dozen page illustrations of the weeds precede the full text of the provincial Noxious Weeds Act.

MISCELLANEOUS

Canada's Future; What she offers after the War, is the title of a symposium, arranged and edited by E. A. Victor of Montreal and published by the Macmillans of Toronto. It is a book of 320 pages, dedicated to H.R.H. The Governor-General, of whom a specially taken photographic frontispiece is presented, and contributed to by some half hundred high officials or recognized au-

thorities on the subjects of which they treat. An idea of the wide area covered by the contents, as well as of the notable character of the contributors, will be gathered when it is stated that Sir George Foster, Minister of Trade and Commerce, writes on Canada's Outlook, Sir Samuel Hughes, Minister of Militia, on Canada's Future within the Empire, Hon. W. J. Roche, Minister of the Interior, on The Ex-Soldier's Opportunity, Hon. T. W. Crothers on Labour Conditions after the War, Hon. J. D. Hazen, Minister of Marine and Fisheries, on the Fisheries of Canada, the late C. C. James, on The Call of Canada, President Falconer of Toronto University, on The Educational Facilities of Canada, F. P. Gutelius, General Manager of Government Railways, on The Future of Canadian Railways, the premiers, or ex-premiers, of Ontario, Nova Scotia, New Brunswick, Prince Edward Island, Manitoba, Alberta, Saskatchewan and British Columbia, on the prospects of their different provinces. Mr. James Caruthers of Montreal writes on Canada's Opportunity, regarding the grain industry, Mr. N. W. Rowell, K.C., on Canada's Century and Sir R. F. Stupart on Canada's Climate. Although Quebec's premier does not figure as a contributor, the Treasurer of that province writes on The Future of Quebec. Agriculture receives special treatment not only through the late C. C. James, Commissioner of Agriculture, but also from the pen of H. S. Arkell, M.A., B.S.A., Assistant Live Stock Commissioner, who writes on The Future of the Live Stock Industry, J. A. Ruddick, Dairy and Cold Storage Commissioner, on The Dairying Industry and Its Future, Dr. Frank T. Shutt, Dominion Chemist, on Science and the Soil, T. G. Bunting, B.S.A., on Apple Growing in Quebec, J. J. Campbell, acting chairman Royal Commission on Agriculture for British Columbia, on Fruit Ranching in British Columbia, and J. S. Dennis, C.P.R. Irrigation Expert, on Making the Desert Bloom, or The Wonders of Irrigation. The financial interests of Canada, the industrial interests, the lumbering interests, the mining interests, the fishing interests and the sporting interests, all receive special attention by well-informed and experienced men. The concluding article is on Sub-Arctic Canada, or What the Yukon Offers, by Alfred Thompson, M.D., M.P. for the Yukon.

Text Book of Land Drainage, by Joseph A. Jeffery Railway Land Commissioner; 256 pages, 5 by 7½ inches; Rural Text Book series; New York, The Macmillan Company. Here is a book of value both to the students of soils and to every farmer who would know more about the land he tills. The language is plain, the subjects well arranged and the numerous illustrations and diagrams exact and explanatory.

NOTES

There will be no winter fair at Regina this year. One will be held at Saskatoon and next year there will be one at Regina.

The United States Crop Reporting Board estimates that the apple yield of the United States this year will be 73,000,000 barrels against an average of 68,000,000 barrels for the last five years.

In Germany and France it is a common practice to plant fruit trees along the highways, the produce of which is sold, the money thus acquired being devoted towards the maintenance of the roads.

O. D. Hicks, B.S.A., a graduate of Macdonald College, has recently been appointed Superintendent of the Soils and Crops Division of the New Brunswick Department of Agriculture.

In Chicago and other cities of the United States efforts are being made to interest city-bred boys in agriculture. In the Illinois College of Agriculture of 1,100 students, 135 are from the city of Chicago. Recently 143 young men from the city listened attentively for 2½ hours to a lecture on horse-judging.

The eleventh International Soil Products Exposition will be held at El Paso, from October 17th to 26th, 1916. The annual sessions of the International Dry Farming Congress will be held during exposition week.

In the July issue of THE AGRICULTURAL GAZETTE, on page 658, the Dominion Sheep Breeders' Association is credited with donating grants of money and cups to the Ontario Winter Fair and the Ottawa Winter Fair. These donations should have been credited to the Ontario Sheep Breeders' Association.

All Danish elementary schools have not only teachers' residences incorporated in them, but possess teachers' gardens separate from the school lot. The profession is looked upon as a life's work, and pensions are a settled institution. Thorough training is stated to be the chief reason of the teachers' success.

The first convention of the National Commercial Apple Growers' Association of the United States, an organization recently formed, as explained, for business only, was held at St. Louis, Mo., August 2nd and 3rd.

Up to the end of June fourteen carloads of cattle had been ordered by farmers in Saskatchewan under the provisions of the Live Stock Pedigree and Sales Act. The majority of the cattle are ordered for districts served by one or other of the Government co-operative creameries. Officials of the Department have visited Ontario for the purpose of selecting suitable stock.

The Alberta Department of Agriculture has established a district office at Sedgewick with J. G. Taggart from the School of Agriculture, Olds, as district agent. This office has been opened as an information bureau for farmers of the district. In addition to general educational work an effort is being made to organize school fairs and to introduce home gardening among school children of the district.

Since the Live Stock Purchase and Sales Act came into force in Saskatchewan in 1913 the following numbers of pure-bred cattle have been distributed: 1913, 37; 1914, 55; 1915, 89; or a total of 181. The grades supplied have been as follows: 1913, 345; 1914, 482; 1915, 368, or a total of 1,195. Total number of cattle supplied, 1,376. During the same three years 3,649 sheep and seven swine were distributed within the province.

The term "home project" has come to have a special meaning in connection with the teaching of agriculture. Applied to instruction in elementary and secondary agriculture, an authority states that it should include each of the following requisites: (1) There must be a plan for work at home covering a season or a more or less extended period of time; (2) it must be a part of the instruction in agriculture of the school; (3) there must be a problem more or less new to the pupil; (4) the parents and pupils should agree with the teacher upon the plan; (5) some competent person must supervise the home work; (6) detailed records of time, method, cost and income must be honestly kept; and (7) a written report based on the record must be submitted to the teacher.

INDEX TO PERIODICAL LITERATURE

- The Canadian Thresherman and Farmer*,
Winnipeg, Man., June, 1916.
The Science of Summer Tillage,
Richard Haste, page 16
- The Farmers' Advocate*, Winnipeg, July
12th, 1916.
Breeding Classes at Exhibitions, page
1025.
The Dual Purpose Shorthorn, Live
Stock Editor, page 1027.
- British Columbia Fruit and Farm*, Van-
couver, July, 1916.
How the Government will Make
Loans to Farmers, page 969.
- The Farm and Ranch Review*, Calgary,
June 20th, 1916.
Raising and Fitting Draft Horses,
Alex. Galbraith, Superintendent of
Fairs and Institutes, Edmonton, Alta.,
page 460.
Rural Short Term Credit and Extension
of Live Stock Husbandry, the
Editor, page 467.
The Practical Services of the Department
of Agriculture, H. A. Craig,
B.S.A., Deputy Minister of Agriculture,
Edmonton, Alta., page 497.
- The Canadian Countryman*, Toronto, July
1st, 1916.
Practical Education for the Ontario
Farmer, Dr. G. C. Creelman, B.S.A.,
M.S., LL.D., President Ontario Agricultural
College, page 3.
What of Consolidation for Ontario
Rural Schools, Prof. S. B. McCready,
page 5.
Alberta Leads the Way in Education—
The Child is Taught to Respect His
Father's Business and the Young Man
and Woman are trained both in Practice
and Theory—Ratepayers of Every
Province should Study the Plans and
Progress of Alberta, E. A. Howes,
B.S.A., Dean Faculty of Agriculture,
University of Alberta, page 7.
- July 8—The Marshes of the Maritime
Provinces—How the Netherlands of
Canada are dyked and Cultivated, by
A. J. Campbell.
- Farmer's Advocate*, London, Ont., June
13th, 1916.
All Kinds of Silos for all Kinds of
Farms, page 1032.
June 29th—Water in the Farm Home,
page 1108.
July 13th—To Make Ploughing Matches
of Practical Value, page 1181.
A Lifetime with Shorthorns, page 1184.
- The Grain Growers' Guide*, Winnipeg, June
21st, 1916.
Co-operation in Wisconsin, M. Wes.
Tubbs, Sec.-Treas. Wisconsin State
Union. American Society of Equity,
page 8.
July 5th—Co-operative Credit Associations—
The Farmers' View—A reply
to the Bankers' statement of the case
which appeared in the May 10th issue
of *The Guide*, A McLeod, of the Thorn-
hill Branch of the Manitoba Grain
Growers' Association, page 7.
Land Legislation in New Zealand, E. A.
Weir, B.S.A., page 8.
July 12th—Cattle Loans in United States
by E. A. Weir, B.S.A., page 7.
Modern Home Canning, page 9.
- The Farmers' Magazine*, Toronto, July,
1916.
Co-operation that Won Out: The
Telephone Situation in Rural Canada
was Settled by Farmers Themselves,
J. Smith Carter, page 6.
The Mormons and Dry Farming—An
Account of First Hand Impressions
Concerning a Peculiar People Who are
Certainly Prosperous Settlers in Al-
berta, C. B. Sissons, page 9.
Our Farm Hopes for Hydro Power—
An Inquiry into what the Hydro
Commission Have Done for Agri-
culture, Cost, Procedure and Results,
F. M. Chapman, page 11.
Jack Miner and His Bird Refugees—
What an Ontario Farmer is Doing for
the Conservation of our Native Wild
Life, Ethel M. Chapman, page 17.
- Farm and Dairy and Rural Home*, Peter-
boro, Ont., July 13th, 1916.
The Progress of the Farmers' Move-
ment in Ontario, J. J. Morrison,
Secretary, United Farmers of Ontario,
page 701.
- Garden Magazine and Home Journal*, Van-
couver, B.C., July, 1916,
The Culture of Hardy Roses, by W. T.
Macoun, Dominion Horticulturist, and
F. E. Buck, B.S.A., Assistant, page 1.
- The Saturday Press and Prairie Farm*,
Saskatoon, Sask., July 22, 1916,
Marketing Our Wool Crop, by Pro-
fessor Tisdale, of the University of
Saskatchewan, page 3.
Hay and Pasture Crops for Saskat-
chewan, by John Bracken, B.S.A.,
Professor of Field Husbandry, College
of Agriculture, Saskatoon, page 7.

VOL. 3, No. 9



September, 1916

DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE

The Agricultural Gazette of Canada

EDITOR · J. B. SPENCER, B.S.A.

Issued by direction of
THE HONOURABLE MARTIN BURRELL
Minister of Agriculture

OTTAWA
GOVERNMENT PRINTING BUREAU
1916

CONTENTS

	PAGE
The Agricultural Instruction Act and the Rural School.....	775

PART I

THE DOMINION DEPARTMENT OF AGRICULTURE

The Agricultural Instruction Act.....	776
The Dominion Experimental Farms:—	
The Feeding Value of Straw.....	781
The Division of Horticulture:	
The Improvement of Potatoes by Hill Selection, by W. T. Macoun.....	784
The Division of Forage Plants:	
Experimental Work with Field Root Seed Growing, by F. S. Browne.....	786
The Fibre Division	788
The Dairy and Cold Storage Branch:—	
Decrease in the Imports of Butter.....	789
Pepsin as a Substitute for Rennet in the Manufacture of Cheese.....	789
Growth in Cow-Testing.....	790
The Fruit Branch:—	
Fruit Prospects in Canada, by D. Johnson.....	790
The Live Stock Branch:—	
Development and Importance of the Cattle Industry, by John Bright and H. S. Arkell	791
The Entomological Branch: -	
Forest Insect Investigation in Stanley Park, Vancouver, B.C., by R. N. Chrystal	794

PART II

THE PROVINCIAL DEPARTMENTS OF AGRICULTURE

Agriculture in Canada:—	
Ontario, by W. Bert Roadhouse.....	799
Field Root Seed Production:—	
Prince Edward Island, by Theodore Ross.....	807
Nova Scotia, by John M. Trueman	807
Ontario:—	
The Production of Mangel Seed.....	808
British Columbia, by H. O. English.....	808
The Hill Selection of Seed Potatoes:—	
Manitoba, by F. W. Bordrick.....	810
British Columbia, by H. O. English	811
Educational Exhibits at Fall Fairs:—	
Nova Scotia, by M. Cumming.....	812
Saskatchewan, by S. E. Greenway.....	813
Alberta, by Jas. McCaig.....	814
Nova Scotia:—	
The Agricultural College, by M. Cumming.....	815
New Brunswick:—	
Seed Selection and Seed Fairs, by J. B. Daggett.....	821
Ontario:—	
Successor to Professor J. B. Reynolds.....	822

Manitoba:—	
Co-operative Fattening of Farm Chickens, by M. C. Herner.....	828
Seed Grain Fairs, by S. T. Newton.....	825
Boys' and Girls' Clubs.....	826
The Crusade Against Weeds.....	827
Ploughing Match Rules.....	827
Saskatchewan:—	
Farm Boys' Camp, by F. H. Auld.....	828
The Better Farming Train.....	828
Additional Hail Insurance.....	829
The Regina Exhibition.....	830
British Columbia:—	
The New Minister of Agriculture.....	830
Notes on the University Agricultural Work, by L. S. Klinck.....	831
Agricultural Legislation.....	831

PART III

RURAL SCIENCE

Rural Life Conferences:—	
Prince Edward Island, by W. R. Reek.....	834
Ontario Agricultural College, by N. A. Campbell.....	836
Manitoba Agricultural College:—	
Short Course for Rural Ministers.....	837
Nova Scotia:—	
Rural Science Summer School, by L. A. DeWolfe.....	838
Better Schools Day in Saskatchewan, by A. W. Cocks.....	839

PART IV

SPECIAL CONTRIBUTIONS, REPORTS OF AGRICULTURAL ORGANIZATIONS, NOTES AND PUBLICATIONS

Sewage Disposal in Rural Districts: —	
Ontario Agricultural College, by Wm. H. Day.....	840
Manitoba Agricultural College, by J. B. Reynolds.....	840
University of Agriculture, by A. R. Greig.....	841
The Intermittent Discharge of Fluids from Septic Tanks.....	841
Societies and Associations:—	
The Canadian Seed Growers' Association:	
Field Root Seed Production, by L. H. Newman.....	842
The Hill Selection of Seed Potatoes, by L. H. Newman.....	842
The Ontario Bee-Keepers' Association.....	843
Holstein Friesian Milk Records.....	843
The Canadian Ayrshire Breeders' Association.....	844
The Western Canada Irrigation Association.....	844
The Entomological Society of Ontario.....	844
New Publications.....	845
Notes.....	848
Index to Periodical Literature.....	850

The Agricultural Gazette

OF CANADA

VOL. III

SEPTEMBER, 1916

No. 9

THE AGRICULTURAL GAZETTE of Canada is published monthly, in English and in French, by the Dominion Department of Agriculture. It is not intended for general circulation. A limited number of copies, however, are available to subscribers at \$1.00 per annum, or 10 cents per copy.

Subscriptions should be forwarded to the Editor, Agricultural Gazette, Ottawa.

THE AGRICULTURAL INSTRUCTION ACT AND THE RURAL SCHOOL

THIS number contains the agreements entered into between the Hon. Martin Burrell, Minister of Agriculture for Canada, and the Ministers of Agriculture of the several provinces, setting forth the lines of work being developed this year with the subsidies provided under THE AGRICULTURAL INSTRUCTION ACT.

The agreements for this, the fourth year, indicate the direction in which it is believed money can most profitably be employed for the advancement of the agricultural industry. An examination of the tables shows that nearly one hundred thousand dollars will be used for agricultural instruction in the rural and higher public schools. The amount is almost three times as great as was used for a similar purpose the first year the Act was in force, when only the five eastern provinces appropriated these moneys for the training of the young. Undoubtedly, a sound principle is involved in this growing tendency. Until Denmark gave a prominent place to agriculture in her school system she remained a poor and backward nation. The regeneration that has taken place since the present remarkable school system has been established, indicates what is possible in any country giving definite direction to the minds of the children.

The success with which agriculture is taught in the public schools, depends greatly on the knowledge possessed by the teachers. It is not enough to merely recite from the pages of an authorized text book, or to demand the passing of an examination based on such lessons. The rural teacher to succeed must be inspired with the necessity of making country life so attractive and so wholesome that the farm population shall be eager to spend their lives in the open country; and must be able to guide the youthful mind in the direction of understanding the principles which underlie the profitable handling of the soil, the crops, the stock, and the finished products of the farm. Having gone this far the way is opened for the average child to acquire a genuine love of the soil for its own sake, and to learn to live and act in harmony with nature's laws.

PART I

Dominion Department of Agriculture

INFORMATION SUPPLIED BY OFFICIALS OF THE VARIOUS
BRANCHES REPRESENTED

THE AGRICULTURAL INSTRUCTION ACT

THE following is the form of agreement entered into by and between the Hon. Martin Burrell, Minister of Agriculture for Canada, and each of the nine provinces of the Dominion, under the provisions of THE AGRICULTURAL INSTRUCTION ACT of 1913, the appropriation to each province and the work to be undertaken by each during the fiscal year ending March 31st, 1917:—

FORM OF AGREEMENT

MEMORANDUM OF AGREEMENT
made and entered into by and between the Honourable

Minister of Agriculture for
Canada, hereunto authorized by
Order of His
bearing date the day
of 19

Party of the First Part;

AND

The Government of the Province
of herein
represented by the Honourable

for
said Province, hereunto authorized
by Order of His Honour The Lieu-
tenant-Governor of said Province in
Council, bearing date the day
of 19

Party of the Second Part,

WHEREAS, under the terms of THE AGRICULTURAL INSTRUCTION ACT, for the purpose of aiding and advancing the farming industry by instruction in agriculture, there shall be paid out of the Consolidated Revenue Fund of Canada to said Province, during the Fiscal Year ending the 31st day of March, 19 , the sum of

and

WHEREAS, it is provided in said Act that the payment of said moneys shall be conditional upon agreement between the Minister of Agriculture and the Government of said Province as to the terms, conditions and purposes within the meaning of said Act, upon and for which the payment of said moneys is to be made and applied.

NOW, THEREFORE, the said parties have mutually agreed that the said moneys shall be paid upon the terms and conditions and shall be applied to the purposes hereinafter set forth, to wit:—

1. One-half of said moneys shall be paid to said Party of the Second Part by said Party of the First Part on the execution of these presents.

2. The balance of said moneys shall be paid to said Party of the Second Part by said Party of the First Part, from time to time, upon

the latter being satisfied that said moneys have been and are being properly expended for the purposes for which said moneys were paid, as hereinafter provided.

3. The said Party of the First Part shall have at all time the right, through such officers of his Department, or other persons as he may designate or appoint for the purpose, to inspect any work carried on through the assistance of said moneys, and may withhold any further payment on account of the same if, in his opinion, the conditions of this agreement are not being fulfilled.

4. The said moneys shall be expended for and applied to the following purposes, the amount to be expended for each purpose being that set opposite the same, to wit:—

5. Should it hereafter at any time be determined that any of the amounts as aforesaid for any of the foregoing purposes can with advantage be varied, then by mutual consent of the parties hereto the same shall be varied accordingly.

6. The Party of the Second Part shall render to the Party of the First Part such statement of the expenditure of said moneys as may be required from time to time by the said Party of the First Part.

7. It is understood that the moneys granted by this agreement are intended to supplement the amounts devoted to agriculture by the Province itself, and are in no wise to be used for the purpose of curtailing the customary provincial expenditure in aid of agriculture.

IN WITNESS WHEREOF, the said Party of the First Part has hereunto set his hand and the Seal of said Department of Agriculture, at the City of Ottawa, this day of 19 .

AND IN WITNESS WHEREOF, the said Party of the Second Part has hereunto set his hand and the Seal of the said Province, at the City of in said Province, this day of 19 .

FEDERAL APPROPRIATIONS TO THE PROVINCES UNDER THE AGRICULTURAL INSTRUCTION ACT, 1916-17

PRINCE EDWARD ISLAND

1. Capital Account..	\$ 500.00
2. Director of Agricultural Instruction and Instructors—salaries and expenses	10,300.00
3. Instruction and Demonstration (including Short Courses)—Live Stock, Poultry, Beekeeping, Horticulture, Fruit-growing and Soils....	3,000.00
4. Women's Work (Women's Institutes).	3,200.00
5. Agricultural Instruction in Public and High Schools..	12,000.00
6. Office assistance	1,200.00
7. Miscellaneous and contingencies.	243 75
Total...	\$30,443.75

NOVA SCOTIA

1. Agricultural College and Agricultural Schools:—	
(a) Capital expenditure to pay interest and sinking fund of cost for construction of and furnishing for Science Building	\$7,500.00
(b) Salaries and maintenance..	23,000.00
	<hr/> \$30,500.00
2. Instructors, Directors, Superintendents and District representatives—salaries and expenses	7,500.00
3. Instruction and Demonstration:—	
Dairying	3,500.00
Poultry.....	1,600.00

Beekeeping.....	\$ 800.00	
Soils (including drainage and field crops).....	3,000.00	
Horticultural and Entomological:—		
Instruction and investigation	8,000.00	
Fruit Growing.....	1,000.00	
Short Courses.....	3,000.00	\$20,900.00
4. Women's Work (Women's Institutes, Homemakers' Clubs, Domestic Science, etc.).....		3,000.00
5. Bulletins, reports, circulars and miscellaneous printing.....		800.00
6. Instruction in Public and High Schools and in Normal Schools in Agriculture, Nature Study, Training of Teachers and School Gardens.....		11,000.00
7. Contingencies and miscellaneous.....		1,159.28
Total.....		<u>\$74,859.28</u>

NEW BRUNSWICK

1. Agricultural Schools:—		
(a) Capital expenditure	\$17,000 00	
(b) Salaries and maintenance.....	4,000.00	\$21,000.00
2. Instructors, Directors, Superintendents and District Represen- tatives—salaries and expenses.....		13,500.00
3. Instruction and Demonstration:—		
(a) Beekeeping	500 00	
(b) Soils and drainage	4,000 00	
(c) Horticulture.....	1,500 00	
(d) Short Courses.....	1,500 00	7,500 00
4. Women's Work.....		3,500 00
5. Bulletins, reports, circulars and miscellaneous printing.....		500 00
6. Instruction in Public, High and Normal Schools in Agriculture, Nature Study and Domestic Science, Training of Teachers and School Gardens.....		12,000.00
7. Contingencies and miscellaneous.....		1,209 60
Total		<u>\$59,209 60</u>

QUEBEC

1. Poultry	\$15,000 00	
2. Horticulture—Fruit growing.....	33,000 00	
3. Bacon	12,000 00	
4. Schools of Agriculture.....	60,000 00	
5. Agricultural teaching in Academies, Rural Schools and Normal Schools	14,000 00	
6. District Representatives, Agricultural Teachers—Agronomies	25,000 00	
7. Experimental Union	2,000 00	
8. Alfalfa and Clover	5,000 00	
9. Seed Selection.....	4,500 00	
10. Beekeeping.....	9,000 00	
11. School of Veterinary Science.....	5,000 00	
12. Dairying.....	25,000 00	
13. Drainage.....	8,000 00	
14. Domestic Science.....	10,000 00	
15. Maple Sugar	4,000 00	
16. Conferences, Publications, etc.....	11,712.23	
Total.....		<u>\$243,212.23</u>

ONTARIO

1. District Representative work including clerical or other assistance in connection with the administration.....	\$100,000.00
2. Agricultural College:—	
(a) Capital expenditure.....	\$75,000.00
(b) Salaries and expenses of additions to staff and maintenance.....	14,000.00
	89,000.00
3. O.A.C. Short Courses, travelling and living expenses of winners of Acre Profit and Live Stock competitions.....	1,800.00
4. To encourage agricultural manual training as applied to work on the farm and Domestic Science in High, Public, Separate and Continuation Schools, and in Universities, to be available for grants and for travelling and living expenses of teachers and others in attendance at Short Courses or other educational gatherings, in addition to services, expenses and equipment, and to be paid out on the recommendation of the Department of Education.....	26,000.00
5. Educational work in connection with the marketing of farm products, including organization of co-operative societies, collection, printing and distribution of information on current prices and systems of marketing.....	5,000.00
6. Stock and Seed judging Short Courses and Institute Lecture Work.....	2,000.00
7. Drainage Work.....	10,000.00
8. Demonstration and instruction in vegetable growing.....	4,000.00
9. Demonstration work on soils.....	4,200.00
10. Work in Beekeeping.....	1,500.00
11. Dairy Demonstrations.....	1,658.45
12. Fruit Work:—	
(a) Experimental work at Vineland Horticultural Experiment Station.....	\$2,500.00
(b) Demonstrations with vegetables and hardy fruits in New Ontario.....	3,500.00
	6,000.00
13. Reserved for a supplementary agreement.....	50,000.00
	\$301,158.45

MANITOBA

1. Instructors and Representatives.....	\$20,000.00
2. Instruction and demonstration.....	12,000.00
3. Women's Work.....	19,000.00
4. Boys' and Girls' Clubs.....	10,500.00
5. Bulletins and printing.....	7,000.00
6. Miscellaneous.....	2,267.21
Total.....	\$70,767.21

SASKATCHEWAN

1. College of Agriculture.....	\$22,800.00
2. Instructors, Directors, Superintendents and District Representatives—salaries and expenses.....	30,700.00
3. Instruction and Demonstration in live stock, dairying, soils, crops, etc., including Short Courses.....	7,000.00
4. Women's Work.....	4,500.00
5. Bulletins and miscellaneous printing.....	3,900.00
6. Agricultural instruction in Public, High and Normal Schools—Nature Study, School Gardens, Domestic Science, Training of Teachers....	4,500.00
7. Contingencies and miscellaneous.....	1,469.76
Total.....	\$74,869.76

ALBERTA

1. Schools of Agriculture:—		
Maintenance.....	\$34,000.00	
Equipment.....	1,200.00	
		\$35,200.00
2. Instructors, Demonstrators and District Agents.....		7,500.00
3. Instruction and Demonstration:—		
Demonstration Farms.....	\$6,500.00	
Demonstration Trains.....	5,000.00	
Dairying.....	2,000.00	
		13,500.00
4. Women's Work.....		3,000.00
5. Bulletins, Publications, Printing.....		2,500.00
6. Miscellaneous.....		47.22
		\$61,747.22

BRITISH COLUMBIA

1. Towards appointment of Inspectors, Instructors, Directors, Superintendents and District Representatives.....	\$15,000.00
2. Farm demonstration and experimental work, field crop competitions, boys' and girls' clubs, crop and stock competitions, cow-testing associations, poultry demonstration stations, co-operative variety tests.....	20,000.00
3. Horticulture demonstration stations, experimental work in vegetable growing and greenhouse work, pathological and entomological investigation work, demonstration and experimental work in various cultural practices in fruits and vegetables.....	7,000.00
4. Agricultural Journal, bulletins, reports, circulars and miscellaneous printing.....	5,000.00
5. Department of Education, towards agricultural instruction in Public, Normal and High Schools.....	15,000.00
6. Contingencies and miscellaneous.....	1,732.50
Total.....	\$63,732.50

RECAPITULATION OF APPROPRIATIONS

	1913-14	1914-15	1915-16	1916-17
Prince Edward Island.....	\$26,529.85	\$27,852.81	\$29,138.28	\$30,443.75
Nova Scotia.....	54,288.45	61,144.45	68,001.87	74,859.28
New Brunswick.....	44,509.93	49,407.20	54,308.40	59,209.60
Quebec.....	159,482.40	187,409.16	215,310.70	243,212.23
Ontario.....	195,733.32	230,868.83	266,013.64	301,158.45
Manitoba.....	51,730.05	58,075.45	64,421.31	70,767.21
Saskatchewan.....	54,296.29	61,152.31	68,011.04	74,869.76
Alberta.....	46,094.95	51,310.41	56,528.82	61,747.22
British Columbia.....	47,334.76	52,799.38	58,265.94	63,732.50
Veterinary Colleges.....	20,000.00	20,000.00	20,000.00	20,000.00
Total.....	\$700,000.00	\$800,000.00	\$900,000.00	\$1,000,000.00

The betterment of agriculture, as I see it, calls for more thorough tillage of the land—putting the same or more labour on a reduced acreage—giving increased attention to some line or lines of improved animal husbandry, producing on the farm more of what is consumed in the home instead of depending on "the store", and a closely organized co-operation in buying and selling.—*F. D. Coburn.*

THE DOMINION EXPERIMENTAL FARMS

THE FEEDING VALUE OF STRAW

IN the older provinces of Canada, the feeding value of the straw of cereal crops is recognized by most farmers. On many farms so great a proportion of the straw is fed along with silage, hay and concentrates that too little is reserved for bedding the stock. In the Prairie Provinces the straw is not so highly valued, as each threshing season witnesses the deliberate burning of

tens of thousands of tons of straw containing valuable fodder and plant feed. With a view to encouraging the conservation of feeding materials so as to foster live stock production, there have been brought together the views of officials and the results of experiments carried on at a number of experimental farms and stations in Western Canada.

BRANDON, MANITOBA

BY W. C. MCKILLICAN, B.S.A., SUPERINTENDENT

IT is practically impossible to arrive at a definite valuation of straw for feeding live stock. Fed alone, it is of very little value, being less than a bare maintenance ration, but used in combination with more nutritious feeds it has a great value in economizing in the cost of production. We have conducted no experiments to compare it with other feeds or to arrive at the feeding value of straw. But we use it in combination with other feeds in practically all our cattle feeding, and we know that large quantities of it can be used with profit. We have demonstrated that cattle can be fattened with only straw and grain, also that cattle, sheep and horses can be win-

tered successfully on straw and a light grain ration. However, the grain would be the major part of the nutriment, so that nothing definite on value of straw results, and every farmer in the West has had similar experience any way.

Calculations as to the number of cattle that might be kept on the straw that is destroyed would be very likely to be misleading, as much saleable feed would have to be used with the straw in order to use it to advantage. I would say, however, that oats and barley now sold at ordinary market prices could be made to bring twice as great a return by using them in combination with straw for the feeding of live stock.

INDIAN HEAD, SASKATCHEWAN

BY T. J. HARRISON, B.S.A., SUPERINTENDENT

AGRICULTURE on the prairie is generally undergoing a great evolution, passing from the days of continuous grain growing to a more permanent and economic system known as mixed farming, the adoption of which will make agriculture more profitable. Instead of burning vast quantities of straw

and wasting many other roughages as is now done, all these will soon be used in conjunction with such feeds as silage, roots, grains and other by-products for feeding live stock.

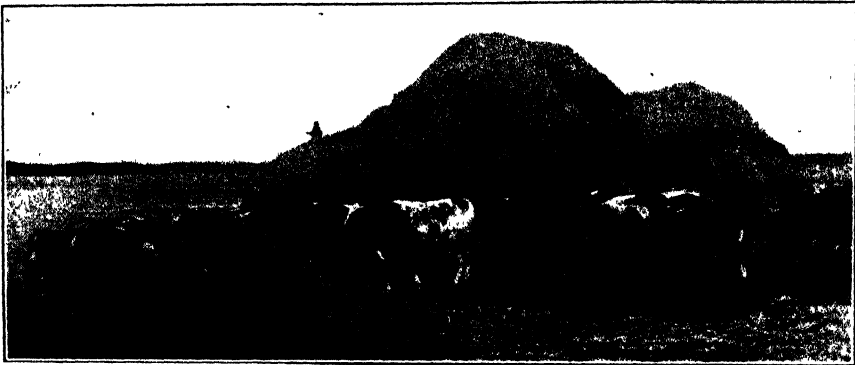
Straw is rather low in protein and fat and relatively high in fibre, a substance requiring much energy for its digestion and disposal. Gen-

erally speaking, straw should not be fed in very large quantities, especially to fattening cattle and heavy milking cows. However, during the winter months, a limited quantity can be fed with good success to idle horses and cattle that are being carried over without materially increasing the weight. In cases where hay is scarce and high in price, a limited quantity of straw can be

fine condition and fit for the hard spring work.

The heifers and dry cows were fed straw in conjunction with silage and roots. These, also, came through the winter in fine thrifty condition.

Straw should not be burned but turned into money by feeding a good bunch of steers. Through the agency of live stock, the rough feeds such as straw and low grade grain



WITH A MODERATE GRAIN RATION CATTLE WINTER WELL ON STRAW

mixed in and utilized in conjunction with other feeds.

At Indian Head during the past winter straw has been used to some extent in feeding cattle and horses. Five idle horses were wintered on oat straw with the addition of sufficient bran and oat chop to maintain the original weight at the commencement of the experiment. These horses came through the winter in

can be profitably utilized and manure manufactured as a by-product. Furthermore, the incalculable waste that is annually practised on the average farm through the destruction of thousands of tons of straw can be avoided. Live stock will profitably utilize these products and thereby increase the prosperity of our agricultural resources.

ROSTHERN, SASKATCHEWAN

BY WM. A. MUNRO, B.A., B.S.A., SUPERINTENDENT

UNTIL very recently, we have had no opportunity of determining the feed value of straw, owing to the fact that we have had no live stock at this station other than the work horses and two dairy cattle.

Last winter, we turned our horses out after they had been fed in the morning, and left them until time to feed them in the evening. During

the day, they had access to an oat and barley straw stack. Their morning and evening meal consisted of about half a gallon of oat chop, and what hay they could eat up clean in twenty minutes. Most of the day was spent in nibbling around the straw stack, and they thrived remarkably well.

I have seen farmers treat horses similarly, with similar results, but

the big mistake that many farmers make is in not supplementing the straw either with hay or grain. Straw alone does not seem to be sufficient for maximum results, but, when fed as part of a ration, it produces good results.

What has been said of horses applies equally well to cattle as feed on many farms in the district. Cattle do not maintain their full condition if turned out loose to straw stacks for the winter, but if stabled for the night or given moderate shelter and

feed of a little grain and hay, they derive a great deal of nourishment from the oat and barley straw. I have never seen thrifty cattle where wheat straw was a prominent part of the ration.

Oat and barley straw can be fed profitably to cattle and horses, by turning them loose around the stack during the day in the winter, only when this is supplemented by adequate shelter and at least a moderate amount of hay and grain.

LACOMBE, ALBERTA

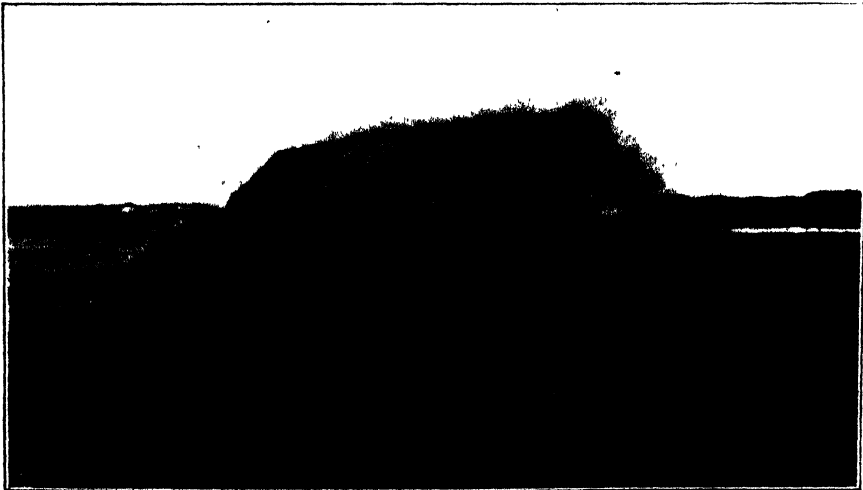
BY G. H. HUTTON, B.S.A., SUPERINTENDENT

THE prevailing weather conditions in Central Alberta during harvest and threshing time are such that the quality of the straw is superior to that available under the weather conditions of Eastern Canada. In addition, much grain is cut on the green side and

tion in reference to the feeding value of straw for stock.

WINTERING HORSES

For some years horses have been wintered at the straw stacks without grain and where the straw has been abundant, and in addition horses



AN UNPROFITABLE DISPOSAL OF STRAW

when threshed the straw so cut must contain a larger percentage of digestible nutrients than the straw which is allowed to become dead ripe before cutting. Some information has been obtained at the Lacombe Sta-

have been able to graze on prairie land not too closely pastured during the previous season; the horses have wintered in splendid condition at a cost of \$1.00 per head per month. It is possible to hire horses wintered

at this figure. While such a statement of cost does not, however, fix a per ton value for straw, it does show that straw has a decided value for carrying this class of stock through the winter.

DAIRY CATTLE

A limited amount of straw is fed to our dairy cattle at all times. Experiments were run during the winter of 1914-15 in which comparisons of various fodders were made. Valuing straw at \$2.00 per ton, turnips at \$3.00 per ton, the ration composed of these two fodders produced a pound of butter at 23.9 cents. Corn silage alone at \$3.00 per ton cost 23 cents to produce a pound of butter, while the cost of butter, when cattle were fed prairie hay alone was 26.4 cents; when fed peas and oats green feed, the cost of butter was 20 cents, and peas and oats silage, 16.7 cents. In all cases the ration of concentrates was the same. As a matter of common practice, it is not recommended that straw should constitute the only bulky fodder fed, but we believe that it can profitably be used in limited

quantities together with some other feeds for dairy cattle and that a value of \$2.00 per ton is justified by the results.

BEEF CATTLE

As a part of the maintenance ration for the breeding herd of beef cattle, straw holds an important place. Straw together with some hay will winter breeding cattle in good shape. We have found that, when steers which are being finished for beef are allowed the run of the straw stack, they make good use, particularly of the chaff in the straw, and will eat it right up to the time they are finished. If, however, straw is offered as an alternative in a separate feed rack with all the hay they require to eat in another rack, we have found that they consume a negligible quantity of straw when on full feed. We have not compared the feeding value of straw from the different cereals, but from observation would consider that good oat straw would have a feeding value twice that of ordinary wheat straw. This latter, of course, is a matter for further investigation.

THE DIVISION OF HORTICULTURE

THE IMPROVEMENT OF POTATOES BY HILL SELECTION

BY W. T. MACOUN, DOMINION HORTICULTURIST

AFTER a variety has been originated, and after its general characteristics have been sufficiently fixed to introduce it, it can be changed, to some extent, by careful selection. This may be undertaken for the purpose of increasing the yield, or to obtain a variety which is earlier or later, shallower in the eye, or of better shape. Selection may also be made to obtain a potato which is more resistant to disease and drought, better in quality, or with a higher percentage of starch; but, while selection is desirable, there needs to be more experimental evi-

dence to show that marked permanent changes in a variety can be made in this way.

The most accurate way to carry on hill selection is by the individual tuber, or tuber-unit method, by which the yield from each individual tuber is kept separate. When the variety to be used has been decided upon, care is taken at digging time to dig a number of hills separately, so that the total product of each hill is known. Each crop from the best of these hills is stored separately. It is desirable to keep about twenty per cent more than will be planted in the

spring to provide for loss during the winter. Plant the same number of marketable tubers, including the best from each of these selected hills, in rows side by side, discarding the rest and planting the tubers whole. If the different lots are planted end to end in rows instead of in rows side by side a stake should be put down to mark the division between each lot. It is important to have the soil uniform. In planting for hill selection it is desirable to have the hills about two and a half feet apart each way, so that the crop from each hill can be kept separate easily when the potatoes are dug.

When digging the best hills are again saved separately from these rows, and the rest of the crop from the best rows may be mixed and used for a field plot, the yield from which should be compared with the yield from the unselected seed, to find if any improvement had been made. The following year there will be enough of the seed from the hill selection to plant a large area. The selection should be kept up from individual hills each year and there should be a gradual improvement to the general crop.

A simpler method of selection and one which will be found to give good results is to dig enough of the general crop by hand each year, so that sufficient seed can be selected from good

hills to give the quantity of seed needed for the general crop. By this method the poor hills, including potatoes of low vitality and those affected with disease, are eliminated and the standard raised. This is perhaps the best method of selection for the average farmer.

While the methods of selection described are mainly for the purpose of increasing the yield it is desirable to select at the same time for purity, trueness of type, improvement of shape of tuber, and resistance to disease and anything else which will improve the value of the crop.

EXPERIMENTS IN HILL SELECTION

Some work in hill selection has been carried on at the Central Experimental Farm, but, while the results from selection at first showed a marked improvement in its favour, when weather conditions were very unfavourable for obtaining seed of strong vitality the gain from previous selection was lost, hence desirability to select from seed of strong vitality each year. The benefits resulting at first from a selection are shown in the table herewith given.

The best hills were selected in 1905 from a crop of Clay Rose, Rural Blush, Gold Coin, Morgan Seedling, Carman No. 1, State of Maine and Carman No. 3 potatoes and with the following result:

Name of Variety.	Total Yield, per acre, selected		Total Yield, per acre, unselected		Difference, per acre, in favour of selection	
	Bush.	Lb.	Bush.	Lb.	Bush.	Lb.
Clay Rose	242		189	12	52	48
Rural Blush	237	36	176		61	36
Gold Coin	211	12	184	48	26	24
Morgan Seedling	211	12	176		35	12
Carman No. 1	193	36	206	48	13	13
State of Maine	189	12	149	36	39	36
Carman No. 3	149	36	149	36	00	00
Average of seven varieties	204	55	176	00	28	55

The best hills of six of the above varieties were selected again in 1906 and compared in 1907 with unselected

and with those which had not been selected since 1905. The results in 1907 which follow, might have been

more favourable to the selections if the seed used had been better, but the season of 1906 was one of the poorest for potatoes which has been experienced. Owing to the dry weather the tops dried up early, and the potatoes were small, and the seed was lacking in vitality, the growth

from it was not regular nor strong. Where farmers experience such results from potatoes after having obtained good results by selection the writer advises a change to seed of strong vitality from another source, and beginning to select over again.

Name of Variety	Total Yield, per acre, selected in 1906, from selection of 1905		Total Yield, per acre, selected in 1905, and not in 1906		Total Yield, per acre, unselected	
	Bush.	Lb.	Bush.	Lb.	Bush.	Lb.
Clay Rose	110		145	12	140	48
Rural Blush	167	12	184	48	114	24
Gold Coin	88		66		101	12
Morgan Seedling	52	48	79	12	114	24
Carman No. 1	131		123	12	96	48
State of Maine	52	48	70	24	52	48
Average of six varieties	100	18	111	28	103	24

Hill selection was begun again at Ottawa in 1910, but after three seasons it was abandoned as the results owing to the seed being of low vitality were not at all promising.

Work in hill selection is being car-

ried on at the Branch Experimental Farms and Stations and interesting results will, no doubt, soon be published in the annual reports of the Experimental Farms.

THE DIVISION OF FORAGE PLANTS

EXPERIMENTAL WORK WITH FIELD ROOT SEED GROWING

BY F. S. BROWNE, B.S.A., ASSISTANT TO THE DOMINION AGROSTOLOGIST

FIELD root seed growing has now become an established branch of the work conducted by the Division of Forage Plants. In general this new line of work comes naturally under two distinct heads, namely, breeding and experimental. The breeding work which is conducted chiefly at Ottawa is as yet in the initial stage and will not be further mentioned. The experimental work, on the other hand, is now well under way and in the following will be dealt with briefly.

The experience of farmers and others who have grown their own root seed indicate that seed grown from reasonably well selected roots will,

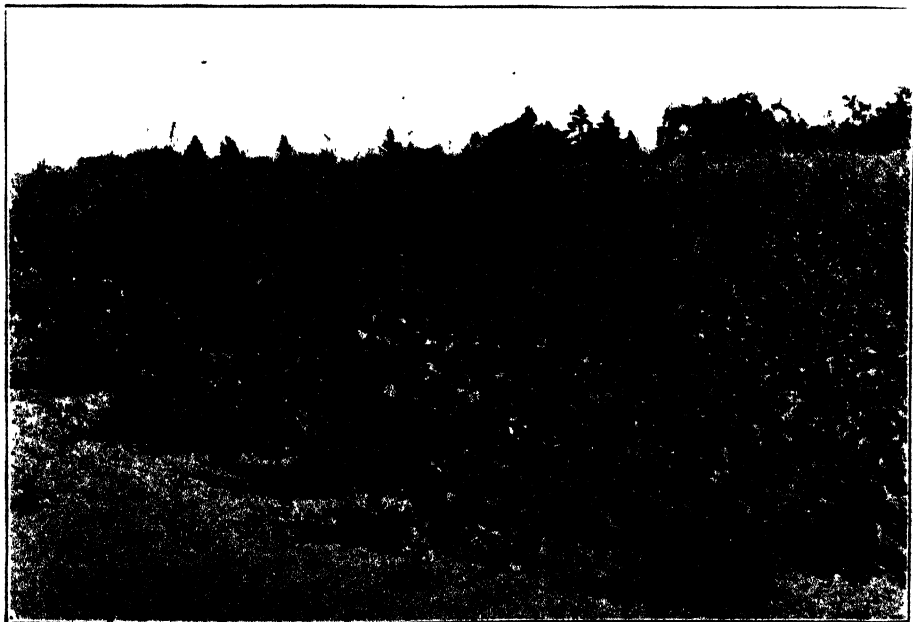
in that same locality, give larger and surer crops than ordinary commercial seed. Seed growing for home use, therefore, not only means saving money that would otherwise have gone to the purchase of seed, but also increased yields of roots. Accordingly, the experimental work in field root seed growing which is being conducted over the larger part of the Dominion Experimental Farm system, has for its object the encouraging of Canadian grown root seed, particularly with a view towards gathering data that will prove useful to individuals who wish to grow the seed required for their own root crops.

Field root seed growing is comparatively new to Canadian agriculture, and, in many of the best root growing districts, little is known of it. Consequently the object of the experimental work with this crop, begun in 1915 was not only to find out the most satisfactory methods to follow for seed growing, but also to



THE CARROT SEED CROP IN FULL BLOOM

ing sections, little is known of it. Consequently the object of the experimental work with this crop, begun in 1915 was not only to find out the most satisfactory methods to follow for seed growing, but also to find out if seed could be successfully produced in the various root growing districts.



THE MANGEL SEED CROP READY FOR HARVEST

During the season of 1915 field root seed growing was attempted on a comparatively small scale at the Experimental Farms and Stations at: Ottawa, Ont.; Charlottetown, P.E.I.; Kentville, N.S.; Fredericton, N.B.; Lennoxville, Que.; Cap Rouge, Que.; Rosthern, Sask., and Agassiz, B.C. In general the results were promising, for in each case where sound roots of either mangels, turnips, swedes or carrots were planted, a crop coming fully up to expectations was obtained. In addition valuable experimental data were obtained that has proved very useful in planning further work.

At the Experimental Farms at Ottawa, Ont., and Agassiz, B.C., fairly large areas of mangel seed were grown. Throughout the season a careful account was kept of the financial outlay necessary for the production of the crop. After threshing the crop of seed was weighed, graded and valued at the prevailing wholesale price, and the profit obtained. At Ottawa the cost of growing one acre amounted to \$79.70, the revenue \$147.42, giving a profit

of \$67.68. At Agassiz the result was also quite favourable and an even larger margin of profit was shown.

For the present season the work has been expanded so that different phases of it are being conducted at Ottawa and at nineteen of the branch Farms and Stations. Briefly the work consists of a repetition of that conducted last year with the addition of further experiments with seed production, the growing of select plots to demonstrate the advantage of careful selection, and the testing of the seed produced last year by growing it in comparison with commercial seed of the same variety.

The prospects for a good season's work are exceptionally bright. The various phases of the experiments are working out smoothly and the general appearance of the crop, at the time of writing, is fully up to expectations. The tests with home-grown versus commercial seed have so far indicated that there is a decided difference in favour of the former with regard to vitality and vigour of the stand.

THE FIBRE DIVISION

A gathering of flax growers was held at Forest, Ontario, on August 14th. The meeting was called for the purpose of demonstrating modern flax harvesting machines in operation. Those who attended were given the opportunity of examining the water method of retting flax straw that was given a trial last year and is producing an

excellent quality of fibre. A field of hemp growing in the neighbourhood of Forest, which shows the possibilities of this plant as a fibre crop in Ontario, was visited and proved of considerable interest. The meeting was in charge of Mr. G. G. Bramhill, the flax and fibre specialist of the Experimental Farms.

It is often necessary in dealing with problems of war expenditure to speak in terms of money, but thinking of those problems exclusively in terms of money often leads people very much astray. For example, I have heard it said that the more money that is spent on home products the better, because the more money is circulated the greater the prosperity. This is a profound error. What the nation needs is goods, labour, and services for the successful prosecution of the war. Everyone's work is wanted either directly or indirectly for this purpose, whether for supplying our fighting forces or for making goods for export with which to pay for necessary imports. Expenditure on non-essentials, whether produced at home or abroad, diverts capital and labour that can ill be spared to purposes which do not help us in winning the war.—*Right Hon. R. McKenna.*

THE DAIRY AND COLD STORAGE BRANCH

DECREASE IN THE IMPORTS OF BUTTER

A few years ago when the imports of butter into Canada from New Zealand began to assume considerable proportions, much concern was expressed in some quarters at what appeared to be a failure on the part of Canadian dairymen to supply the needs of the country in this article of food. Of course, it would have been easy to have supplied all the butter required by making that much less cheese, but it paid the farmers of Eastern Canada better to make cheese.

The situation is now being rapidly changed by the increase in the production of creamery butter in the prairie provinces and it will only be

a short time, if indeed the time has not already arrived, when there will be a surplus of this article for export in addition to supplying all the needs of the Pacific Coast. In this connection it may be interesting to state that, according to advice just received from New Zealand, the quantity of butter shipped to Vancouver during the New Zealand export season, which ended June 30th, was only 213 tons as against 1,385 tons during the corresponding period in 1914-15. The largest quantity of butter imported into Canada during any one year was in 1913, when a total of 3,567 tons was received, most of which came from New Zealand.

PEPSIN AS A SUBSTITUTE FOR RENNET IN THE MANUFACTURE OF CHEESE

IT appears that certain persons, for reasons best known to themselves, are circulating reports to the effect that cheese made with pepsin "does not keep", etc. In view of the quantity of pepsin now being used it might be injurious to the good name of Canadian cheese if such assertions were allowed to go uncontradicted.

During the week ending May 27th several lots of experimental cheese were made at the Finch Dairy Station from mixed milk divided into two vats, one of which was "set" with pepsin and the other with rennet extract. These cheese are still on hand in the curing room and no difference can be found in the flavour of the two cheese in any of the tests.

Any statements to the effect that cheese made with pepsin are inferior to cheese made with rennet extract are absolutely unfounded, providing, of course, that the pepsin is of good quality and is properly used.

There are different forms and strengths of pepsin being offered at the present time and cheese makers should be careful not to use anything which has not been carefully tested and proved to be suitable for the purpose by some disinterested and competent person.

Pepsin is now being used at the Finch Dairy Station and its use there will be continued until we can purchase rennet extract at not more than \$5 per gallon.

GROWTH IN COW-TESTING

THE number of milk samples from individual cows tested in July was 28,599: this is an increase of 5,250 over July, 1915, and marks the greatest number handled during any one month as well as the greatest annual increase since the inception of the movement in 1906.

The dairy recorders in all districts report increasing interest in the work on the part of dairy farmers, more care being taken to weigh and sam-

ple regularly, as well as to continue weighing right through the lactation period. Recorders also look for further enlargement of their respective territories. The proportion of cows freshening during the winter months is reported to be increasing.

Some of the new points where cow testing associations have been formed are Foster, Vaucluse, Trois Pistoles, Que., Hartland and Grand Manan, N.B.

THE FRUIT BRANCH

FRUIT PROSPECTS IN CANADA

BY D. JOHNSON, FRUIT COMMISSIONER

IN the spring of 1916 the fruit orchards of Canada gave promise of large crops. This promise, however, has to some extent disappeared, owing to the fact that in Ontario and Quebec, the constant rains and cold weather of spring caused the fruit to drop badly and fungous diseases to develop to a serious extent. In fact apples have been so affected by scab in Ontario that less than 25 per cent of the entire crop will grade No. 1.

In Western Ontario there is a fair crop of apples, but the quality, except where orchards have been carefully and thoroughly sprayed, is poor indeed. In the eastern parts of the province the crop will be much lighter than last year, and the quality even poorer.

British Columbia will have a crop of apples some 15 per cent larger than last season, and of much finer quality. Nova Scotia will have about 600,000 barrels of apples, also of excellent quality.

The peach crop of Canada will not be quite as large as last year. In the Okanagan district of British Col-

umbia the hard winter destroyed a large number of the trees, so that the crop is not expected to be more than 60 per cent of last season. This also applies to apricots and plums. In Ontario there will be an excellent peach crop of fine quality, but somewhat less in quantity than 1915. Plums will be about one-third of last year's production.

There is every indication that the Canadian fruit crop will be harvested at prices that will be remunerative to the grower. All the wholesale and retail houses are reporting increased sales over the last two or three years. In fact in the Western provinces practically all the wholesale houses reported an increase of more than 50 per cent in their sales over last year. This is no doubt due to the huge grain crop of 1915, the assurance of another large crop this season and the high prices which have existed for wheat. The farmers in the Western provinces now feel that they can enjoy the luxury of fruit, which for the last few years they have felt to be secondary to other necessities.

Soft fruits such as cherries, rasp-

berries and strawberries, black and red currants, moved into consumption at excellent prices, and the general trend of crop conditions is such as to cause an optimistic spirit to exist in the fruit trade.

The grape crop of Canada will be the best in many years, and the consumers in this country will be fortunate in having placed at their disposal this most excellent fruit at reasonable prices.

THE LIVE STOCK BRANCH

DEVELOPMENT AND IMPORTANCE OF THE CATTLE INDUSTRY

BY JOHN BRIGHT, LIVE STOCK COMMISSIONER, and H. S. ARKELL, B.S.A., ASSISTANT COMMISSIONER

CANADA has no source of wealth more dependable, more profitable, or more permanent, than that represented in her flocks and herds. The cows and heifers of this country are the potential parent of a product that is beyond value to the Dominion and the Empire. As a war measure the British Government has already imposed restrictions against the slaughter of calves and females. We are not in the war zone, but we are continually facing the danger involved in the loss of large numbers of good beef calves, in the slaughter of breedy and serviceable heifers and cows, and in the exportation annually from the country of thousands of stockers and feeders.

THE SACRIFICE OF CALVES

This fact suggests a drain upon our resources that, at the present moment, the country cannot afford to ignore. Consider the almost wanton destruction of our calves. A hundred pound calf is a thousand pound steer in embryo. Kill the calf and you net but a fifty or sixty pound delicacy for the table of an epicure. Kill the steer and you provide five or six hundred pounds of substantial beef for the upbuilding of the manhood of the world. Canada cannot view without serious concern the killing of its beef calves. It will be counted against us if we fail to utilize the provender, grass, hay, straw, grain that otherwise is an-

nually uselessly lost on the Western prairies. A glance at the following figures will indicate pretty clearly that an immense dividend would accrue from returning to the farm drafts of calves that continue to find their way to the big central markets:

CALVES MARKETED IN CANADA

1914	103,269
1915	125,556

THE SLAUGHTER OF THE COW

Barren heifers and worn-out cows can find no better destination than death. Good husbandry is intolerant of drones, while to those which have generously served their generation it provides a useful end. But cattle capable of rearing offspring represent an asset to their owner and to the country which may easily be recognized as constituting one of the most important factors in the business development of the Dominion. Nature is prodigal of her gifts, but deals hardly with those who are improvident in their use.

It cannot but furnish food for thought, therefore, when we observe the number of heifers and young cows of excellent type which are sold to the local butcher, or find their way to the central markets for slaughter at the abattoirs.

The homesteader would add to the comforts of his family, decrease his living expenses and very materially strengthen his financial position in dealing with his banker, by having

and breeding a few cows. The mixed farmer has already learned his lesson and is demonstrating its truth in all the Western provinces. He may now, however, with advantage, add to his holdings wherever such is possible.

In the ranching business one of the greatest drawbacks has been the insufficiency of winter feed. Heavy losses in the breeding herd can largely be eliminated by careful provision in this direction. It will, perhaps, be admitted as a fact that present conditions on the range necessitate an expenditure of capital and labour which was not formerly required. An adjustment, therefore, of methods of management will make possible a more intensive use of range land, thus ensuring considerably greater production in the herd.

From another point of view, the grain farmer is being induced to consider the returns from cattle as compared with the returns from wheat. The argument in favour of stock farming has become more insistent, as experience has indicated its real significance. The expansion of cattle raising in this direction represents a field which has hardly yet been touched. Its extension to grain farms will, besides conserving the resources of the land, lead to the elimination of an enormous amount of waste in feed and at the same time add very greatly to the live stock output of the country.

STOCKERS AND FEEDERS

There remains to consider the exportation of our stockers and feeders. This business has apparently grown up since the advent of the herd laws, when homesteaders and farmers have locally found themselves, in the late summer and early fall, short of grass. As a result, large numbers of two-year-old stuff have been dumped on the market at a period when prices tend ordinarily to about the lowest level of the year.

Is this good business? We think

not. Owing to the slump in prices, on account of big shipments during the early fall months, all that the farmer is usually able to realize for his stocker stuff is from four and a half to five cents a pound. It will be understood that we speak of previous seasons' experience. For very good material he may get more, while for anything under average there is very slow sale. Present advices from St. Paul state that for the time being, the stocker and feeder market is slow, owing to the hot weather damaging the pastures over a wide area and on account of the rush of harvest work. It may be accepted as a fact that the period in question is anything but a good selling season. In other words, the farmer is obliged to take less than his cattle are intrinsically worth.

This is clearly indicated when it is borne in mind that the feeder, which nets the Canadian farmer but five cents a pound, costs the American cattleman practically seven cents to put into his feed lot. The two cents difference is absorbed in speculative profits, transportation charges and commission fees. The Canadian farmer has at his disposal millions of tons of roughage which are wasted every year, and very great quantities of coarse grain, which are annually sold to the nearest elevator at a very low price. He would appear to have a great advantage over the American cattleman, who has to operate on high priced land with a large investment in feeding plant, and whose feeds cannot be had as cheaply as in this country. Nevertheless, the American farmer puts in his cattle at seven cents a pound and admittedly makes money. Under these circumstances, it will be a pity if Western Canada lets such an opportunity pass from her control.

We are glad to be able to state that, while some cattle have already gone south, the stocker and feeder movement, during the first seven months of this present year has been

in favour of Western Canada. The bumper grain crop of 1915 has provided sufficient ready cash to enable our own farmers to finance the feeding of more cattle. Owing to the plentiful spring rainfall the hay crop is considerably above the average. While during the past years, the hot seasons have burned the pastures badly, the grass on the prairies has revived very greatly this season and has developed a root such as it has not had for five years. With the feed situation developing in such a promising way, it is evident that a confident attitude is warranted as regards the prospects for cattle feeding.

THE MARKET PROSPECT

As regards live stock, we will do wisely to increase our productive capacity to the fullest possible extent. During the period of the war, all available beef will be in strong demand and cattle prices will be high. What may happen following the declaration of peace is problematical, but eminent authorities point out that after the great wars of history there has always been an abnormal demand for live stock.

In any event, in Canada, in the United States and in Europe there is a confidence in the future of the live stock trade, the like of which has not been experienced for a lifetime. That country will be fortunate which, by the careful husbanding and utilization of its resources, achieves the position of being able to wholesomely and prudently expand its output during the succeeding years. Canada may easily place herself in the way of attaining a very powerful place in the export meat business if a determined policy of expanding production is systematically practised.

FINANCIAL ASSISTANCE

To discuss this whole question, at the suggestion of the Canadian Bankers' Association of Western

Canada, and with the approval of the Dominion Minister of Agriculture, the Live Stock Commissioner and the Assistant Commissioner attended a conference with the members in Winnipeg. With an appreciative understanding of present conditions, the Association expressed a desire to actively co-operate in the efforts which are being put forth in varying directions to increase production and expand Canada's live stock trade. The result of this conference was the appointment of a committee of members who should constitute a medium through which a more active and clearly defined propaganda in this direction could be entered upon. The Department, through the markets policy of the Branch, proposes, with the approval of the Association, to keep in close touch with developments, in the hope of being able to assist in co-ordinating the efforts which the banks are prepared to make in general support of this movement. We believe that bankers and farmers will early find themselves in a position which will steadily make for co-operation of interest and of effort as this campaign progresses.

THE TIME IS OPPORTUNE

If our argument has been accepted up to this point, it will be granted that the opportune moment is at hand when an effective move can be made to offset the serious drain upon our resources represented in the loss of beef calves, in the slaughter of breeding females and in the exportation of stockers and feeders. It will be conceded also that the time has arrived for actively venturing upon a constructive policy in the development of a comprehensive export meat trade, with fair and reasonable promise of success. This means that, in the first place, it is the business of every farmer to contribute his quota in expanding the production of the country. Under these circumstances

owners are strongly recommended to feed as many of their own cattle as they can, provided, of course, that they have available sufficient supplies of fodder and grain to insure full gains in the cattle they keep. When this is not possible, buyers and commission men would do well to encourage those who have practical experience in the cattle feeding business to add to their holdings by purchases from stock offered for sale locally or on the central markets.

We would again urge the retaining

for breeding purposes of every suitable healthy female, old or young. To develop and hold business, we must increase our stock. Therefore, save the heifers, spare the calves, keep the cows. Breed always to a good bull. Carefully rear the young. Feed the growing stock a full ration. Fatten the bullocks until ready for market. Only thus can we make a reputation which will be worthy of the position secured for the Dominion by her sons at the front.

THE ENTOMOLOGICAL BRANCH

FOREST INSECT INVESTIGATION IN STANLEY PARK, VANCOUVER, BRITISH COLUMBIA

BY R. N. CHRYSTAL, FIELD OFFICER FOR FOREST INSECTS

ON a peninsula lying to the north of the city of Vancouver, and comprising an area of somewhat over 900 acres, stands the tract of forest land known as Stanley Park, leased to the city over twenty years ago for park purposes, by the Dominion Government. Some years since, it was noticed that the health of a large proportion of the coniferous trees, principally the Sitka Spruce and the Western Hemlock, was being seriously affected by some agency unknown at the time, many trees being already dead and others in a dying condition. As a result of representations by the citizens of Vancouver and others interested in the preservation of the natural beauty of such a place, both from the point of view of the pride of possession, as well as its value as a financial asset to the city, the Entomological Branch commenced an enquiry into the cause and extent of the damage during the summer of 1913. In that year Mr. J. M. Swaine, Assistant Entomologist for Forest Insects, inspected the area and made a preliminary report, in which he emphasized the

need for further investigation. This was followed by the establishment of a Forest Insect Laboratory in the Park, early in the spring of 1914, the work having been steadily continued during the last two years.

FOREST CONDITIONS

In its original state Stanley Park was a mixed stand of Western Cedar (*Thuja plicata*), Sitka Spruce (*Picea sitchensis*), Western Hemlock (*Tsuga heterophylla*); and Douglas Fir (*Pseudotsuga mucronata*); many years ago, however, logging operations removed the best of the larger timber, only a small proportion of the big trees being left, and these by no means the soundest specimens. In its present state it consists of a mixture of second growth of the species just named, with a certain proportion of large trees here and there, along with a considerable mixture of deciduous species, such as Maple, Cherry, Willow, of various kinds, and others; these in many places occupy the entire areas on which they occur.

INVESTIGATIONS

Mr. Swaine's first report in the autumn of 1913 showed that the Sitka Spruce and the Western Hemlock were the trees worst affected, the Spruce suffering from the attacks of a species of gall aphid of the genus *Chermes*, and in certain places also being attacked by the Sitka Spruce Bark-beetle, *Dendroctonus obesus* Mann., this beetle proving itself to be a very efficient ally to the *Chermes* in completing the destruction of the trees. The hemlock was being defoliated extensively, both large and small trees, by the caterpillars of a geometrid moth belonging to the genus *Therina*, very closely allied to, if not identical with, the species *T. ferridaria*, which has been many times reported as doing much damage to the oaks in the Victoria district of Vancouver Island. Preparations were made in the spring of 1914 to study the life-histories and habits of these insects in relation to their host trees, as a result of which the following points are now made clear.

THE SITKA SPRUCE

THE SITKA SPRUCE GALL APHIS, *Chermes cooleyi* Gillette. This insect must be held responsible for the death of a large number of the spruce in Stanley Park, and the serious injury of a considerable portion of the remainder. The injury to the tree consists of the transformation of the young shoots into cone-shaped galls, each individual needle is swollen at its base to form a chamber in which the young lice develop, and from which they commence to emerge during June. The forms emerging from the galls are winged, and they migrate from the spruce to the Douglas fir; this fact being proved by means of experiments carried out in the Park, supplemented by direct observations in the field. The winged migrants settle on the needles of the fir and produce a generation of non-

winged forms, which remain stationary on the needles throughout the remainder of the summer, autumn and winter, until early in the following spring. They then cast their winter coats, increase in size, and commence to lay eggs, from which come a generation which is dimorphic in character, containing

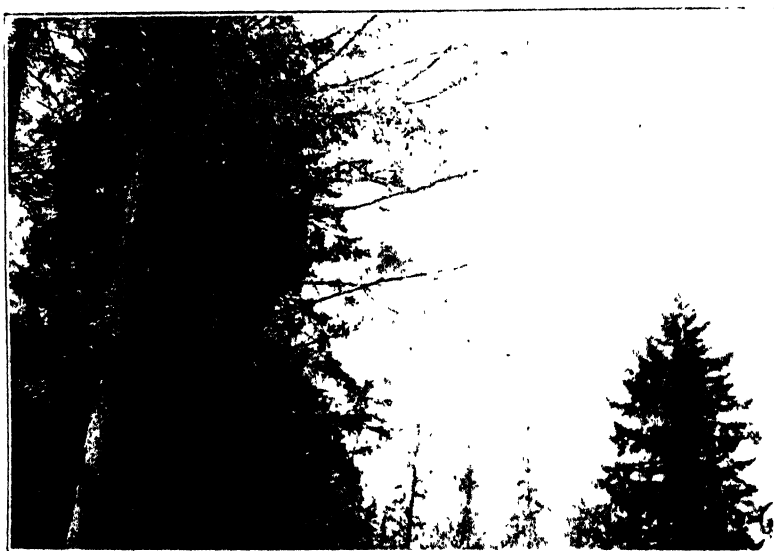


GALLS OF THE SITKA SPRUCE
GALL APHIS, ON SITKA SPRUCE
STANLEY PARK, VANCOUVER.
(After Swaine)

both winged and wingless forms, the winged forms flying back to the Sitka Spruce and producing a generation which will provide stem mothers for the next season's gall producers, whilst the wingless forms remain on the Douglas fir and seem to undergo little or no change throughout the summer. The

damage to the spruce is very great, owing to the fact that the galls are of such a size as to completely kill the twig, and hundreds of galls may be found on a single tree. A careful survey of the Park was made in order to determine the extent of damage to the spruce by this insect, and such a heavy percentage of trees under 100 feet in height were found to be either dead or beyond hope of recovery, that all thought of spraying to destroy the aphid was abandoned. Experimental spray-

tion of the areas was made, and as many infested trees as possible marked for removal, which was successfully carried out in the spring of 1915. The removal and destruction of the broods in about three dozen beetle-infested large spruces has effectively checked an outbreak of these beetles which had spread from a half-dozen to over two dozen large trees in the season of 1914, and threatened to kill out the remaining large spruce in Stanley Park in a few years.



A SITKA SPRUCE KILLED BY THE SITKA SPRUCE GALL APHIS; THE GALLED TWIGS SHOW ON THE RIGHT AGAINST THE WHITE BACK GROUND), STANLEY PARK, VANCOUVER, B.C. (Original)

ings proved that this pest is readily controlled by contact insecticides.

THE SITKA SPRUCE BARK-BEETLE, *Dendroctonus obesus* Mann. This beetle was found in isolated patches doing damage to spruce, already much weakened by the attack of *Chermes*, and in the vicinity of Beaver Lake by adverse soil conditions caused by the raising of the level of the lake, which undoubtedly had a great effect on the trees around the shore. To check the spread of the beetle an examina-

THE SITKA SPRUCE GREEN APHIS, *Aphis abietina* Walk. In 1914, an additional enemy to the spruce in the Park, namely, the Sitka Spruce Green Aphis, was found in considerable numbers on the needles early in the spring. Winged migrants commence to appear early in the summer, but so far all efforts to trace their secondary host plant have failed. The injury to the spruce is practically confined to the older needles, which become discoloured and fall just about the time the new

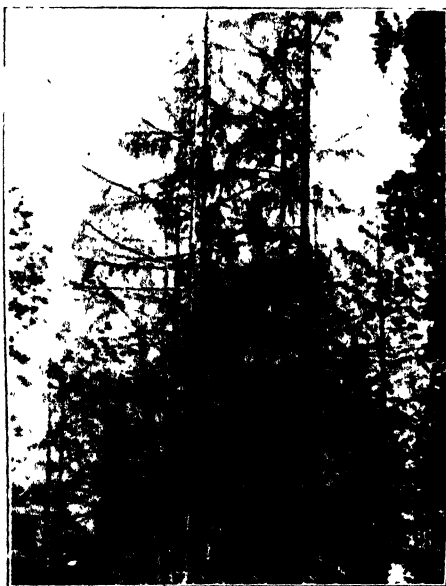
needles are fully developed; in the case of a tree badly attacked the effect is very characteristic. This insect has been studied in detail in England by Prof. F. V. Theobald, who reports having met with it on a large number of species of spruce in parks and gardens, and Prof. H. F. Wilson, of Wisconsin, who reported the insect as doing serious damage in the spring of 1915 to Sitka spruce all along the coast of the States of Washington and Oregon. So far as Stanley Park is concerned no spruce has been observed which has been killed solely as a result of the aphid injury, and in one or two cases trees which were badly attacked a year or two ago, having lost a large proportion of their needles, have now completely recovered and are thriving. The power of the insect to kill the trees unaided has, however, been demonstrated in the case of Sitka spruce in Beacon Hill Park, Victoria, B.C., where several trees have been killed as a result of its attacks, and others are in a serious condition. In Stanley Park, up to the present, it has merely proved itself a very efficient ally of the *Chermes*. It is readily controlled by spraying with contact insecticides.

THE WESTERN HEMLOCK

The damage effected by *Therina* caterpillars to hemlock, in 1911 to 1913, was very great, whole tracts of large trees being killed, and a great number of others in various parts of the park being seriously if not irreparably damaged. Observations in 1914 showed a great diminution in the number of the caterpillars, the improvement in condition being particularly marked in the case of the younger trees along the drive-ways, which, completely defoliated in 1913, retained their foliage in 1914, those worst affected showing signs of a return to their normal conditions again. This improvement in condition consequent on the control of the caterpillars was directly due to nat-

ural causes, chiefly insect parasitism, which was very noticeable in 1914, the parasite being a tachinid fly. During 1915, hardly any signs of caterpillars were seen in Stanley Park, and the present summer (1916) shows a like condition.

A species of *Chermes* was found seriously infesting isolated hemlocks in several parts of the park, the trees worst affected having their foliage covered in the spring with the white woolly excretion of the stem mothers. In one or two cases evidence went to



DEAD HEMLOCK, KILLED BY THE
WESTERN HEMLOCK LOOPER,
STANLEY PARK, VANCOUVER
(Original)

show that the trees had died owing to defoliation consequent upon the attacks of this insect; a further study of its life-history and habits is necessary, however, before any detailed statement of its importance can be given. Predacious larvæ of syrphid flies in appreciable numbers were observed feeding upon these insects in 1915, and it is probable they have some influence upon their control. The aphid has been less abundant this season than usual.

THE WESTERN CEDAR

The majority of the large cedar trees in the park are top-dead, this condition being apparently caused by a fungus heart-rot; so far no insect of serious importance has been found affecting the foliage or bark.

THE DOUGLAS FIR

Beyond the fact that it serves as a secondary host of Sitka Spruce Gall Aphis, this tree has been found practically immune from any very serious pest at the present time; this holds good on the coast generally, except that several inconsiderable outbreaks of the Douglas fir bark-beetles have been located.

REGENERATION AND CONTROL MEASURES

The first proposals for the control of the damage being done to the spruce and the hemlock were based on the spraying of the trees along the driveways with a high power sprayer, which would maintain a stream at a height of from 100 to 130 feet. A contact spray, (Nicotine Sulphate and soap), was to have been employed for the *Chermes* work, and a poison spray (Lead Arsenate), for the hemlock caterpillar. With the

disappearance of the latter during the summer of 1914, and the discovery that the majority of the smaller spruce were already so seriously affected as to render all attempts to save them unprofitable, these plans were abandoned and methods of regeneration considered as the most practical measures to be taken. Up to the present only trees affected by bark-beetles, and on that account an active menace to their neighbours, have been removed, with the addition of dead trees which are liable to prove dangerous if badly rotted. It is intended, however, finally to inaugurate some system of replanting the areas now occupied by dead hemlock and spruce with young trees, the Douglas fir being the species most favoured for this purpose. At the same time a general clearing of the stands, removing the masses of debris and underbrush which at present encumbers them, will probably be undertaken to such an extent as is deemed necessary or advisable. It has been suggested, and the idea is a good one, that opportunity might be taken to introduce exotic species of conifers into the park, which would be the basis for the future development of an arboretum, the educative value of which would be considerable.

The factors in this agricultural re-organization are naturally many, but none is greater than the educational factor. Before much improvement can be made, rural communities must set up a leadership of their own, such as is now seldom found there. The demand is for men and women imbued with the spirit of masterful action and thoroughly prepared to cope with the difficulties of present-day agricultural life. Properly directed education can best furnish this leadership. If we have educated men and women, the other great problems cannot resist solution. The farmers will then come to realize with Moses that the soil is holy, and that to treat it properly they must put back into it at least as much as they take out of it year by year. The right kind of education will help the farmers to become organized and so enable them to hold their own against the centralized interests of city life. In fact, every phase of social, economic, and spiritual retardation in agricultural districts may be expected to yield to such a new educated leadership.—*Harold W. Foght*—in "Rural Denmark and its Schools."

PART II

Provincial Departments of Agriculture

AGRICULTURE IN CANADA

ONTARIO

BY W. BERT ROADHOUSE, DEPUTY MINISTER OF AGRICULTURE

TO visualize the extent of the province of Ontario a few comparisons may be helpful. In the first place take the British Isles and multiply them by three and one-half, or take France with its wealth and resources and multiply its area by two, or even take Germany and double its size, and you

ican Republic. With these geographical comparisons in mind then it can be appreciated that the entire extent of the province is slightly over two hundred and sixty million acres. Of this, of course, comparatively only a small portion is as yet developed. A very large amount, probably over thirty million acres,



A TYPICAL ONTARIO FARM SCENE

still have an area which is smaller than the aggregate area of the province of Ontario. For comparisons on our own continent it would be necessary to take nine or ten of the average Eastern States of the Amer-

ican Republic. With these geographical comparisons in mind then it can be appreciated that the entire extent of the province is slightly over two hundred and sixty million acres. Of this, of course, comparatively only a small portion is as yet developed. A very large amount, probably over thirty million acres,

five million assessed acres, of which about fifteen million acres are cleared. There is in addition the vast region known as New Ontario, which includes the clay belt, which alone is estimated to contain twenty million acres. This is now being opened up and there is no doubt but what there are agricultural possibilities as yet untouched far greater than what have so far been developed. This gives scope for work for years to come, but the purpose of this article is to outline what has been accomplished rather than attempt to unfold the future.

ought else. Accordingly they left their homes and everything almost that they possessed in order to live in British territory. Immigration continued very slowly at first but after the European wars of 1816 a considerable flow of immigration from the British Isles started this way. Included among these were many of the very best types of English, Irish and Scotch blood, and to these men, together with the United Empire Loyalists of the earlier days and their respective descendants, is due the enduring credit for having laid so well the foundations of this



A FARM SCENE IN NEW ONTARIO

EVOLUTION OF THE PROVINCE

It is not yet a century and one-half since even the best settled sections of Ontario were but a vast forest, tractless, except for the trail of the Indian. It was British territory, however, and when the American War of Independence wrenched the English settlers along the Atlantic coast from beneath the British flag, there were ten thousand or more sturdy Britishers who thought more of their British connection than of

province.

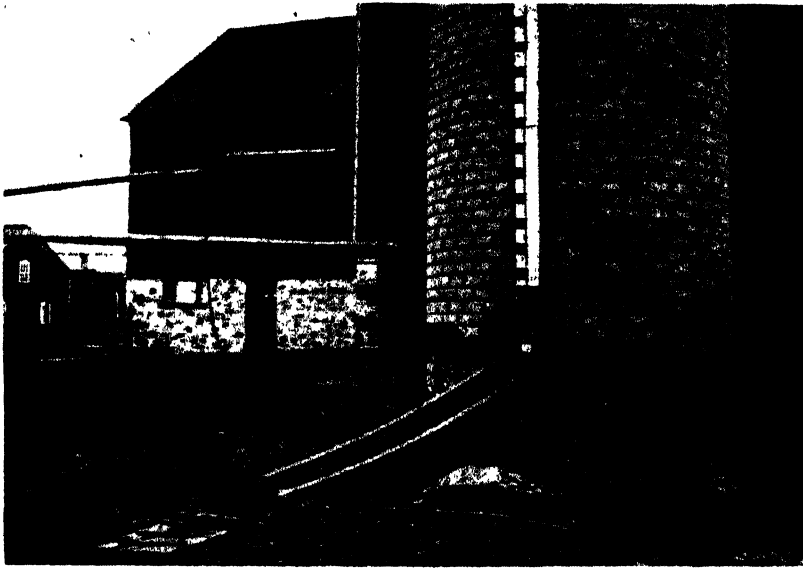
STAGES IN DEVELOPMENT

There is no doubt but that Ontario, or Upper-Canada, as it was then called, had many attractions for the settler even in its early days. Its soil was fertile, its land was rolling, rivers and lakes abounded everywhere and there was a variable conformation which was also attractive. Even the sturdy forests did not daunt the stout hearts of the rugged pioneers.

Then too it was practically the last West available to adventurous spirits, for in those early days few had dreamed of the possibilities of the prairies beyond. The first settlement was along the lakes and rivers which constituted the means of necessary transportation. Gradually the forests were pushed farther back and still better homes arose, and to-day, if one would picture the development which has taken place, one must place on one side the almost unbroken forest of a century ago, and on the other side the nearly

for his family, against the picture of the farmer of to-day who in his new automobile speeds gaily over the same twenty-five miles of road in a little more than an hour. To this scene of rural Ontario must be added the scores of prosperous and progressive towns and cities which are dotted every few miles and play their part in serving the provincial communities as well as the great country beyond.

The population of Ontario has shown a steady and uninterrupted increase. What fluctuations there



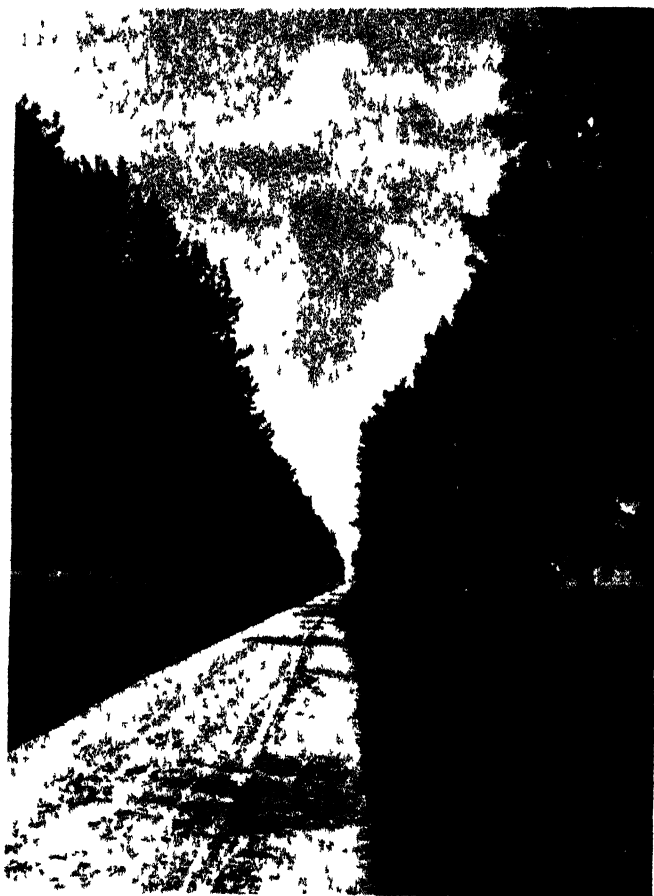
ELECTRICITY FOR POWER AS WELL AS LIGHT IS BEING ADOPTED ON MANY ONTARIO FARMS

two hundred thousand splendid farm homes and buildings, reached by fifty-five thousand miles of rural highways and served by three thousand miles of steam railways and about five hundred miles of electric railways, and equipped with approximately eighty-five thousand rural telephones. To this contrast one is also tempted to add the contrast of the early pioneer, who shouldered a bag of wheat on his back and trudged twenty-five miles to the nearest mill, taking the flour home to make bread

have been as to the rural and urban distributions! At first of course, it was almost entirely rural, but when the clearings assumed even small proportions villages and towns began to spring up. In 1871 the rural population represented 80.6 per cent of the whole and in 1881 it represented 77.2 per cent. The rural population reached its highest in 1881, and between that time and 1891 there was a slight decline. The rural population in the last census was one million two hundred and

ninety-five thousand three hundred and twenty-three (1,295,323) against eight hundred and eighteen thousand nine hundred and ninety-nine (818,999) urban. In the early nineties there was a slight trend to the West and this gained in volume in the latter part of the nineteenth century and early part of the twentieth.

the low prices of agricultural produce created an economic condition which made the openings of the West look specially attractive. As the tide flowed to the West another economic factor developed. The West being largely agricultural, it required to be clothed and fed on other things than cereals and consequently there was



SHADED ROADWAYS LIKE THIS MAKE ONTARIO LANDSCAPE PICTURESQUE

Along with these Western opportunities, mechanical inventions lightened farm work so that fewer men were actually required on the land. Furthermore, the number of men on the land in Ontario was out of proportion to the number of consumers in other pursuits, and, consequently,

a market created for the products of Ontario factories, and these in turn created a demand for help in Ontario factories to supply the Western needs.

Rural Ontario from 1891 to 1911 contributed about one hundred thousand (100,000) of her sturdiest and best sons and daughters. The rural

population as disclosed in the last census of 1911 was one million one hundred and ninety four thousand seven hundred and eighty five (1,194,785), as compared to an urban population of one million three hundred and twenty eight thousand four hundred and eighty nine (1,328,489). Hence the balance was entirely changed and the result was an improvement in market conditions and better prices for agricultural produce. The decrease in the rural population, however, is worthy of

The early settlers laid the foundation of the live stock industry by bringing out to Ontario some splendid specimens of horses, cattle, sheep and swine, which flourished in the old land.

At the same time it must be noted that in early years growing of both fall and spring wheat and barley as cash crops was a general practice. Looking back over twenty-five years only it is interesting to note the changes which have taken place in this regard. While the change in regard to fall wheat is not so notice-



SEEDING OPERATIONS ON AN ONTARIO FARM

special note in the subsequent consideration of the produce of the province which, notwithstanding this fact, has shown material increase.

EVOLUTION IN FARMING

Favoured by conditions of soil, water, climate and intelligent farmers the products from Ontario farms have always set a high standard. Even from the early days live stock constituted a branch of activities and this province has never been so entirely given up to grain growing as have some of the newer provinces.

able, there is on the whole a striking decrease in the acreage devoted to wheat and barley, and an equally striking increase in the acreage devoted to oats, corn, hay and clover, as well as roots and mixed grains for feeding. Along with this there has been a steady increase in the number of live stock, and there has been an entirely beneficial tendency to feed the stock of the farm on the farm and to sell the finished article on the market. The following figures as to acreages in 1890 and 1914 may be of interest:—

	F. Wheat	S. Wheat	Barley	Oats	Corn	Hay and Clover
1890	720,101	601,753	701,326	1,882,366	223,836	2,462,002
1914	685,692	118,607	579,473	2,776,883	708,922	3,415,484

Along with this it is interesting to note the increases in live stock over the twenty-five year period. Of course there have been fluctuations from year to year in that time, but the following figures tell the story:—

generally to beef cattle, but heads of beef cattle and swine may be found in every county.

There is now in the province a fruit industry which represents possibly twenty million dollars annually, and



A PICTURESQUE SCENE, BUT ALSO SUGGESTIVE OF THE WEALTH OF ONTARIO'S DAIRY INDUSTRY

	1890	1915
Horses	659,636	779,131
Milch Cows	777,838	1,022,518
Other Cattle	1,116,874	1,652,228
Swine	1,140,559	1,769,295
Sheep	1,339,695	908,095
Poultry	6,854,864	14,273,091

SPECIALIZED FARMING

Practically all parts of what is known as Old Ontario are now engaged in mixed farming with most farms having some line on which they specialize. Dairying is adopted very generally in Eastern Ontario, where there are nearly nine hundred cheese factories, and in Western Ontario, where there are a large number of creameries and a few cheese factories. In the more northerly counties, districts are devoted more

a vegetable industry which aggregates several million dollars. Fruit growing has flourished in Ontario and 75 per cent of all the fruit in the Dominion is grown in this province. This includes 99 per cent of the peaches and grapes, 60 per cent of the plums, 70 per cent of the apples and 80 per cent of pears and small fruits. The peach-growing areas are located for the most part in the Niagara district skirting Lake Ontario as far west as Niagara, but new and promising districts are now being developed in Norfolk, Essex, and Lambton counties. The Niagara district is also the large vineyard of the province, but plums and apples are grown in most sections. The special apple sections, however, are in Western Ontario, especially

along Lake Erie and Lake Huron and north as far as Georgian Bay, and in Eastern Ontario along Lake Ontario and the St. Lawrence, including in the latter Dundas county, which is the native home of the famous McIntosh Red apple, now commemorated by a monument marking the place where the first McIntosh tree was grown over one hundred years ago. Altogether 306,767 acres are devoted to orchards, 24,360 to small fruits and 11,136 to vineyards. The products are marketed in the provinces in the West and to some extent in the export markets of Great Britain.

country home. This movement has assumed considerable popularity in the vicinity of the larger centres and is likely to continue in the years to come.

Ontario's annual returns from her fields aggregate in a good year over two hundred million dollars. To this should be added possibly over another one hundred million from her live stock products. Thus it is seen, in spite of the very substantial contribution which the province has made towards the building up of the other provinces of Canada, a contribution which she does not begrudge and which has undoubtedly



FARM HOMES LIKE THIS ARE NOT UNCOMMON IN THE NIAGARA FRUIT BELT

Another phase of the development of Ontario agriculture which may be mentioned is the number of splendid country estates which are being built up adjacent to our large towns and cities. There has in recent years been a considerable trend, on the part of the men who have made their money in other pursuits, to purchase the old homestead, or some other good farm, and appreciating it for its agricultural value make it also a

been beneficial from a national standpoint as well as conducing to individual prosperity in many cases, she has at the same time succeeded in showing progress at home. To further emphasize this point it is of interest to quote the following figures showing the contrast in twenty-five years, development in connection with the farm lands, buildings, implements, and live stock in this province:—

	Farm Land	Buildings	Implements	Live Stock	Total Farm Property
1890	622,886,000	193,438,826	50,515,583	104,086,626	970,927,035
1914	790,538,706	347,348,643	91,703,876	250,870,078	1,480,461,303

In connection with this development the work of the Ontario Department of Agriculture has undoubtedly had an important phase as a guiding factor, but that is another story, which space does not permit being told here.

AS TO THE FUTURE

As to the future there is scarcely

maintained, and in many cases it is possible to point to larger returns per acre in recent years than in years long gone by. There is a growing demand on the part of the farmers in general for knowledge of the best methods, and there is every reason to believe that the rising generation will maintain, if not surpass, the efforts of the generation now passing away. With the splendid resources which



APPLE BLOSSOM TIME IN OLD ONTARIO WHERE SEVENTY-FIVE PER CENT OF THE FRUIT OF CANADA IS GROWN

room for anything but optimism. Ontario, because of the diversity of the agriculture of the province, as above outlined, has many problems to face which are not in evidence in other provinces, but there is every reason to believe that these problems will be solved to the advantage of the people as a whole. The fertility of the soil, which is the basis of agriculture, is for the most part being well

this province, therefore, possesses, unequalled anywhere on the continent. with the advantages in the way of markets and increasing conveniences which population make possible, there is every reason for stating that the progress of the past will be fully duplicated by achievements of the future in Old Ontario, the Mother of Provinces.

FIELD ROOT SEED PRODUCTION

The production of field root seeds in Canada, owing to the European war and its effects, is a question of unusual interest at the present time. In this issue several of the provinces have outlined the policy being followed, and the encouragement being given to farmers in this work. On page 786 the experimental work in field root seed growing being conducted at the Dominion Experimental Farm and at a number of the Branch Farms and Stations is outlined, while on page 842 the work of the Canadian Seed Growers' Association in this respect is detailed by Secretary L. H. Newman.

PRINCE EDWARD ISLAND

BY THEODORE ROSS, B.A.

THE production of field root seeds in this province is being encouraged in several ways.

(1) By the offering of cash prizes at the Seed Fairs, five of which are held annually.

(2) By making the growing of field root seed a pupils' home project, which may be offered by a teacher

in qualifying for a nature study bonus.

(3) By brief articles in the press from time to time.

No one has taken the matter up in a large way. A number of farmers are growing a few pounds for sale, and, a much larger number, sufficient for their own use.

NOVA SCOTIA

BY JOHN M. TRUEMAN, B.S.A., PROFESSOR OF AGRICULTURE, TRURO

IN the spring of 1915 at the Nova Scotia Agricultural College, we planted about one acre with turnips for seed. The plants grew well, but, when harvesting time arrived, we found that the labour of carefully cutting them and saving the seed was much greater than we had anticipated. For this reason we concluded that it would be best to recommend to farmers that every man wanting good turnip seed should plant a comparatively small area, and thus raise only enough seed for himself, or possibly enough more for a few neighbours.

There is a section in Nova Scotia, in Yarmouth County, where the farmers have been growing turnip seed on a commercial basis for a number of years. These men raise from 20 to 100 lb. each per year.

This work is being guided and encouraged by the Seed Branch of the Dominion Department of Agriculture under the direction of S. J. Moore, the official representing the Department in the Maritime Provinces.

This year at the Agricultural College, in the farm department, we have planted two varieties of turnips and one of mangels. Instead of setting out an acre we have restricted our work to the following number of plants for each variety: Sutton's Champion Swede, 80 plants, Bangholm Swede, 200 plants, Sutton's Yellow Intermediate Mangel 260 plants.

In addition, the Horticultural Department is raising some vegetable seeds. They have planted the following varieties:—

	Variety	No. of Plants
Parsnips	Student	640
	Abbotts' Hollow Crown	68
Carrots	Chantenay	60
	Long Orange	68
	Danvers Half Long	320
Swedes	Corning's Lapland	320
	Carter's Holborn	
	Invictus	68

In addition to growing these few seeds on the college farms, the agents of the provincial Department of Agriculture are encouraging farmers to grow more of their own seeds, especially of Swedes, and are giving field instruction as to how this may be done.

ONTARIO

THE PRODUCTION OF MANGEL SEED

DURING the past spring a large quantity of mangel roots was distributed from the Ontario Agricultural College for the production of seed. In addition to those planted on the college farm some twenty-thousand stecklings were distributed to about thirty growers over the province. The stecklings were placed in the hands of men who had proved, through their work in connection with the Experimental Union, to be reliable, and a quantity was also placed with the Director of the Industrial Farms.

Dr. Zavitz has been working upon the production of mangel seed for a number of years. Repeated tests proved the Yellow Leviathan to be the most suitable variety for the Ontario farmer, it being a large yielder and a good keeper. The next step was to select the best individual roots of this variety for seed production. Having perpetuated these for a number of years a first-class strain possessing fixed habits was secured.

Having established a satisfactory strain the next step was to produce a large supply of roots for seed production. Experience would indicate that for this purpose fully developed roots are not necessary, but that a small immature root (steckling) weighing about half a pound is quite satisfactory. Experiments are being carried on by Dr. Zavitz this year to determine more accurately the relative value for seed purposes of large, medium and small roots.

In preparation for the present year Dr. Zavitz grew a large number of stecklings at the college farm. The seed was sown late in July, well cultivated during the season, but not thinned as in the ordinary root growing practice. The crop of stecklings produced was stored over winter in root houses and pits and supplied to reliable growers free, the growers paying only the transportation charges. The college also sent out to careful farmers a large quantity of home-grown seed.

BRITISH COLUMBIA

BY H. O. ENGLISH, B.A., B.S.A., CHIEF SOIL AND CROP INSTRUCTOR

ALTHOUGH agricultural authorities throughout America predicted a scarcity of field root seed during 1915 and 1916 as one direct result of the European war, the farmers of Brit-

ish Columbia have not been affected by any such shortage. The prices paid for root seeds in this province have been normal in spite of the fact that there was an increase of 52.1 per cent in the acreage devoted to

the production of field roots in 1915 over that of 1914. It is estimated that there is a much larger acreage devoted to root crops this year than in 1915.

To meet the predicted shortage the Department of Agriculture early in 1915 instituted a campaign to induce the farmers in various parts of the province to grow field root seeds. A number of farmers were induced by a personal canvas to attempt the production of root seeds, and, to assist these, a circular bulletin was issued, which outlined briefly the manner in which the best root seeds might be produced.

The results obtained lead to the conclusion that, while root seed may be produced in most parts of the province, the previous experience of the grower and local conditions play an important part in the success or failure of the undertaking. In view of these facts the Department has not encouraged farmers to undertake the growing of root seeds on a large scale, preferring to recommend that farmers begin by growing sufficient seed for their own use before undertaking the production of seed as a commercial proposition.

The greater value of home-grown root seed, as compared with imported seed, has been demonstrated over and over again this year. The Department distributed six hundred pounds of home-grown mangel seed at the time of the annual seed distribution in March of this year, and from all parts we have received reports of the remarkable vitality of the crops grown from this seed. I have inspected a number of fields in person and find that in spite of the very unsatisfactory growing weather during the early part of the summer, the mangels grown from this seed give promise of heavier and more satisfactory yields than do those crops grown from imported seed.

We are, therefore, laying more emphasis upon the greater returns secured from a crop of roots produced from home-grown seed than upon the great profits to be reaped by growers of root seeds. At the same time, we have not overlooked the fact that the good results obtained from the local seed were in a large measure due to the high quality of the strain from which the seed was produced.

To interest the farmers in the production of root seed the Department has worked along the following lines:—

First:—The best seed available of proven strain was distributed during the spring to furnish the right kind of foundation stock to prospective growers.

Second:—Prizes amounting to \$159 were offered in connection with root seed production. In these competitions the area of the seed plots was placed at $\frac{1}{4}$ acre.

Third:—The various phases of the industry were placed before the farmers in all parts of the province during the spring lecture tour by officials of the Department, and this, together with the individual persuasion used in certain districts, played a considerable part in the encouragement of the industry.

The nature of the province makes it impossible for us at this time to estimate the acreage which will be devoted to root seed production this year. Needless to say, we realize, while we are not encouraging the farmers to rush blindly into this industry, that this province is pre-eminently suited to the production of all kinds of small seeds. We trust that when we have discovered the best strains of the hardiest varieties that our farmers will do their share in producing the small seeds for the use of Canadian farmers, if not for export.

THE HILL SELECTION OF SEED POTATOES

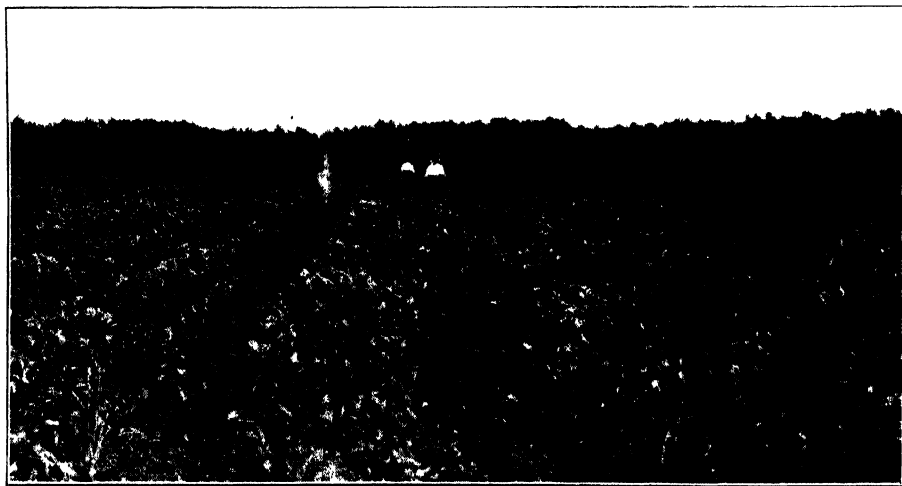
The selection of seed potatoes from the hill may be made, and is, a very important factor in the improvement of the potato crop. As this crop is an important one in Canada, there has been here brought together the work accomplished in the provinces of Manitoba and British Columbia. The experiments in this work carried on at the Dominion Experimental Farm, with attendant results, are detailed on page 784, and on page 842 is outlined the work accomplished, and encouragement given to this method of potato improvement by the Canadian Seed Growers' Association.

MANITOBA

BY F. W. BRODRICK, B.S.A., PROFESSOR OF HORTICULTURE AND FORESTRY, MANITOBA AGRICULTURAL COLLEGE

THE value of selection of tubers in the improvement of the potato crop has been clearly demonstrated in the numerous experiments that have been carried on by Experimental stations, and by private individuals, demonstrating that such desirable characteristics as

generally practised. Selection of tubers, however, is not seed selection, as the potato is really an underground stem and the planting of potato tubers is a vegetative means of propagation. By the numerous experiments carried on, however, the advantages derived from seed selection



A MANITOBA POTATO FIELD

These potatoes are being grown for seed purposes

earliness, vigour of growth, productivity and size and uniformity of tubers can be developed and intensified in this way.

The value of seed selection in the improvement of farm crops is now universally well-known and quite

are quite as regularly obtained in the fixation of characters in the potato, by tuber selection, as by means of seed selection in other crops.

In the improvement of the potato, some standard of perfection for each variety should be outlined, and the

work of improvement directed toward a well defined end. Being an important commercial crop, those characters which would affect its commercial value should receive especial consideration. The interests of both the grower and the buyer should receive consideration in the development of a standard for any variety. The grower is concerned in the yield and the marketability; the buyer in the texture or cooking value and the economy in peeling or shallowness of eye, and their interests overlap in keeping qualities, freedom from disease, and in uniformity of type.

The following score card is one that is suggestive of a card that could be used in scoring samples of seed potatoes. Consideration, however, would have to be given to the peculiarities of the individual varieties:

Yield	20
Uniformity of size and shape	15
Maturity	15
Freedom from Disease	15
Texture	15
Shallowness of eye	10
Trueness to type	10
	- -
	100

The development of a perfect type can only be secured by a careful and rigorous selection. The first selection should be made in the hill, selecting only those hills that exhibit vigour of growth and pronounced resistance to disease. This selection should be followed, after harvesting, by a careful selection and grading of the tubers, selecting for seed

purposes only those that are mature, uniform in size and shape, and free from disease.

Very little, as yet, has been done in the systematic improvement of the potato crop in Manitoba. The commercial possibilities of potato production are great, and valuable work can be done in the isolation and improvement of localized varieties. Soil conditions in Manitoba vary quite considerably and, as soil conditions affect quality, careful attention should be given to the selection of varieties which are well suited to given localities.

The potato growing contests in connection with the boys' and girls' clubs will undoubtedly do a great deal to stimulate more extensive potato growing in Manitoba, and will encourage the use of better varieties. The value of tuber selection can also be more clearly emphasized in this way.

Summing up, it could be said that the lines of work that can be carried on with greatest success in the improvement of the potato crop in Manitoba are: -

1. The production of varieties by selection and crossing, that are better suited to Manitoba conditions.
2. Keeping up standards of quality by continuous hill and tuber selection on the individual farm.
3. The development of a specialized seed plot for potatoes on each farm.
4. The careful isolation of varieties grown for seed purposes.
5. Emphasizing the value of home-grown seed.

BRITISH COLUMBIA

BY H. O. ENGLISH, B.A., B.S.A., CHIEF SOIL AND CROP INSTRUCTOR

WE have no data to hand showing the results obtained from the hill selection of seed potatoes in this province. Soil and climate conditions have been so favourable to the

production of this crop in most parts of the province that farmers have not considered it necessary to exercise additional care in the selection of their seed.

A few of the more progressive

farmers have adopted this practice and the results have been so striking as to mark these men as the best producers of seed potatoes in their respective districts. It has been noticed in every instance that where the practice of hill selection of seed potatoes is followed greater yields have been obtained, and subsequent crops have been almost entirely free from such diseases as "Black Leg" and "Dry Rot". Other diseases which appear to be largely controlled by hill selection are Late Blight and Rhizoctonia.

This year special work will be carried on in a number of districts where the farmers have either formed "Seed Potato Centres" or are anticipating such a move. In these districts the farmers are this year conducting potato competitions and in each district arrangements are being made to conduct field demonstrations in the hill selection of seed potatoes at the time when the judge is going over the plots. In this way, it is hoped that we will be able, not only to hold a field demonstration in the seed selection, but also to lay the

foundation of what should prove to be, in the future, a valuable source of reliable data on this subject.

This article would not be complete without some mention of the work which is being accomplished by our boys' and girls' potato competitions. Last year the yields harvested by the boys and girls were much greater on the average than those obtained by the men. In one district in particular, the Eagle River Farmers' Institute District, the boys and girls by their splendid example aroused the older farmers to an appreciation of the possibilities of their district with the result that this year the farmers of that district have organized a Potato Seed Centre and all the members of that centre are growing one variety of potatoes, Gold Coin.

This year we are conducting ten boys' and girls' potato competitions and in connection with as many of these as possible field demonstrations will be conducted in the hill selection of seed potatoes for next year's planting of competition plots.

EDUCATIONAL EXHIBITS AT FALL FAIRS

NOVA SCOTIA

BY M. CUMMING, B.A., B.S.A., SECRETARY FOR AGRICULTURE

THE outstanding feature at the present time of the work of the College of Agriculture, Truro, N.S., is its dairy propaganda, which has already resulted in a tremendous increase in butter and other dairy products in the province of Nova Scotia. For this reason the main educational exhibit to be put on under the direction of the officials of the College of Agriculture at the Provincial and other exhibitions will be a dairy exhibit. Plans have been completed to conduct at the Provincial exhibition at Halifax a modern, up to date, cream gathering creamery, in connection with which

all phases of dairying will be demonstrated. It is expected that the sale of butter, butter-milk, fancy cheese, etc., at this exhibition will largely defray the expenses of this demonstration. The manufacturers of dairy machinery will co-operate with the college in this demonstration.

REVIVAL OF OLD ARTS

In connection with the Women's Institute, plans are also being completed for demonstrations at the Provincial and probably other exhibitions. For the current year the demonstrations will be largely along

the lines of the revival of old arts with special reference to linen manufacture. Spinning wheels and other machinery used in connection with linen making will be operated, and similar demonstrations with a view to reviving some of these old processes which are now attracting so much attention, and the rewards of which are so much greater in these days than in the time when people were compelled to make their linen and woollen goods at home. Along with this the Women's Institutes have planned to make a special feature of gardening. Vegetables will be exhibited in attractive styles, the canning of vegetables and fruits will be demonstrated, and by means of placards and literature it is proposed to try to get the women of the country to compel their husbands to set aside an area of land for gardening purposes with a view to

bringing about more pleasant and healthful conditions on the average farms of the country.

DEMONSTRATION IN SOILS

It is also proposed in connection with exhibits to feature the soil work such as is carried on by our agricultural chemist and his assistants at the College, who is now making a soil survey of the whole province, having analyzed in the past three years some hundreds of samples of soil, and having arrived at some valuable information in regard to their strong points as well as the deficiencies of local soil deposits.

It is quite possible as the time approaches further additions may be made to these lines of demonstrations, but in the meantime the attention of the Department will be devoted largely along the lines presented in the foregoing.

SASKATCHEWAN

BY S. E. GREENWAY, DIRECTOR, EXTENSION DEPARTMENT OF THE PROVINCIAL UNIVERSITY

THE University has made a practice in previous years of selecting a number of the larger small fairs in the southern part of the province to make an exhibit thereat of mounted specimens from the Field Husbandry Department, and from the Natural History Department, with pictures of the university campus, buildings and a full line of literature in connection with university work. This plan entailed considerable expense for expressage on parcels and the equipment of the tent, and other paraphernalia for showing, and did not appear to be doing the work for which it was intended. In the last two years the university has provided an exhibit for the provincial summer fair at Regina. This exhibit consists of

selections from the Live Stock Department and Poultry Department and has proved very popular. This year the university exhibited at the provincial summer fair two carloads of live stock and poultry, also a carload of mechanical appliances from the mechanical engineering department. The attractiveness of the exhibit was increased by a display of charts from the Field Husbandry Department and other departments. In view of the fact that a large attendance of citizens from remote parts of the province is the rule at the Provincial exhibition, and also in view of the fact that an annual farm boys' camp is held there, the influence of the exhibit appears to be extending every year and much good is expected to come therefrom.

ALBERTA

BY JAS. MCCAIG, M.A., EDITOR OF PUBLICATIONS

THE Department of Agriculture for Alberta carried out its demonstration train itinerary this year so as to make the exhibits and instruction furnished by the train available to the visitors at the larger fairs. On Saturday, July 1st, the train was in the Calgary exhibition grounds, at Red Deer on Friday, July 7th, during the progress of the fair, and at Edmonton on Wednesday, July 12th. The train this year is considerably larger than it was in the two previous years. It includes fourteen cars in all, containing live stock, models of farm buildings, exhibits of grains, grasses and noxious weeds, dairy and poultry products, specimens of mounted game and samples of work from the provincial agricultural schools, besides nursery car, lecture car, diner and sleeper. It is estimated that not less than 5,000 people visited the train at both Calgary and Edmonton, and well over 1,000 at Red Deer.

A PRACTICAL WEED EXHIBIT

While all the exhibits were inspected with interest, there were certain features this year that attracted more than the usual degree of attention. Mounted specimens of weeds, for example, have become more or less conventional and commonplace. This year the Seed and Weed Department had a live exhibit of weeds in boxes of soil, germination grain tests, and different varieties of clovers and alfalfa. All the weeds designated as noxious under the Alberta Act were included, and many others besides. The list included Canada Thistle, Perennial Sow Thistle, Stink-weed, half a dozen varieties of Mustard, Shepherd's Purse, Couch Grass, Sorrel, Dock, Russian Thistle, Ragweed, Pigweed, etc. In the Provincial

Veterinarian's car were shown growing specimens of poisonous Hemlock, Larkspur, Death Camas and Loco weed. Besides the weeds the weed and seed car contained the commercial grades of grain, official grades of sieves, and samples of grass seeds and potatoes.

FROM THE AGRICULTURAL SCHOOLS

Of similar interest were the exhibits from the agricultural schools, which filled three cars and exemplified the courses and interests of the schools, including carpentry and building, blacksmithing and farm mechanics, the applications of motor-power, agronomy, fodders and grains, cookery, sewing and laundering. Special interest was taken in the lecture and demonstration work in the canning of fruits, meats and vegetables, the emphasis of which related to the preservation of cheaply produced summer garden foods that commonly go to waste. The nursery car was made good use of by the mothers. The live stock lectures, live stock exhibits, farm buildings, poultry, dairying and game were up to the usual standard.

RESULTS IN MEYER CUP COMPETITION

The first award of the A. E. Meyer trophy for stock judging by teams of three of the senior year boys of the Alberta provincial schools of agriculture was made following the carrying out of a judging programme at the Calgary exhibition. The stock judged included dairy and beef cattle, horses, sheep and hogs. On the basis of a total of 1500 possible marks for the three students in five competitions the results were as follows: Vermilion, 1063; Claresholm, 1129; Olds, 1142; the last mentioned winning the trophy for the year of 1916-17.

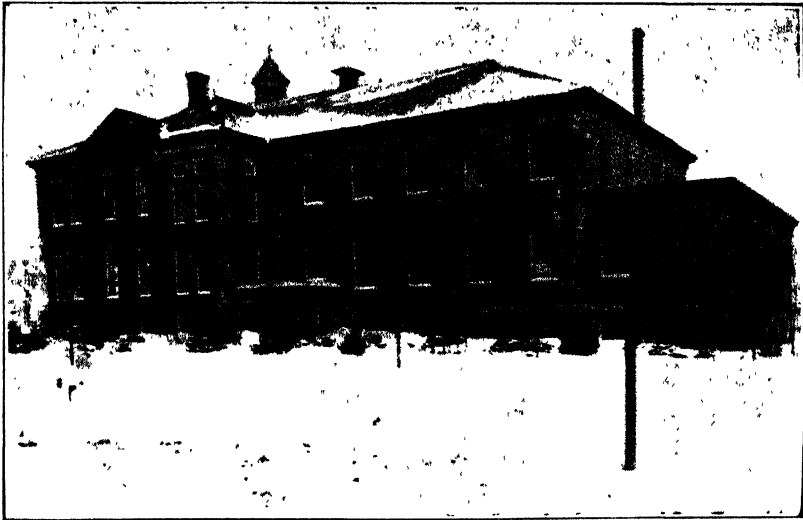
NOVA SCOTIA

THE AGRICULTURAL COLLEGE

BY M. CUMMING, B.A., B.S.A., SECRETARY FOR AGRICULTURE

THE first agricultural school in Nova Scotia was opened in 1885, when a Chair of Agriculture was established in connection with the Provincial Normal School at Truro. For two years, the work of the school was confined largely to lectures and laboratory work, but in 1888 the nucleus of the present Agricultural College property was purchased, an Experimental

called "Model Farm". In 1893 a School of Horticulture was established at Wolfville in affiliation with Acadia University, a small area of ground attached to the school being used for experimental purposes. Both the School of Agriculture at Truro and the School of Horticulture at Wolfville did splendid pioneer work, enrolling among their graduates men who are now widely known



NOVA SCOTIA AGRICULTURAL COLLEGE, MAIN BUILDING
The large addition on the right was erected out of the Federal Grant

Farm established and an Agricultural School building erected. The location was on what is known as Bible Hill, about one mile north-east from the Truro railway station, and within reasonable access of the Provincial Normal College. In the year 1897, the School was burned, but classes were continued in connection with the Normal College and the farm was conducted as a so-

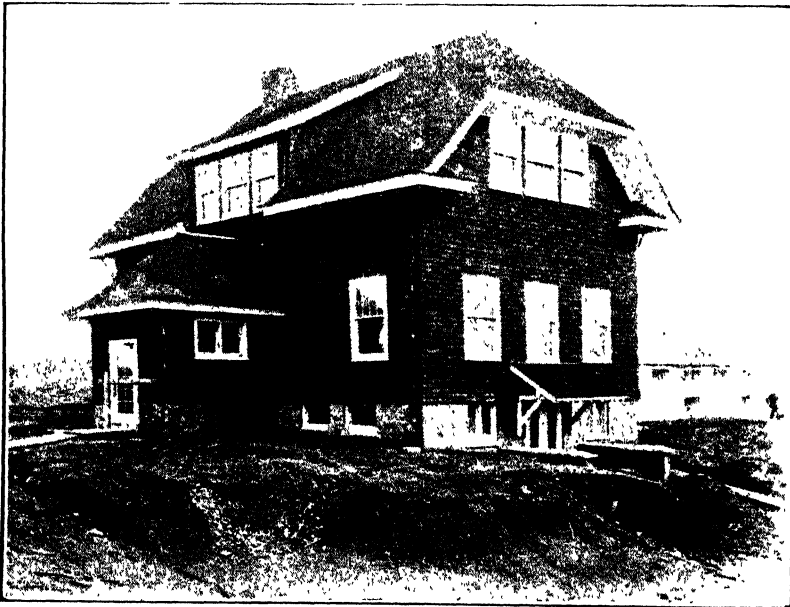
as leaders in the realms of practical and professional agriculture.

THE COLLEGE

Following an agitation of some years, the Government of Nova Scotia finally decided to unite both of these schools into one Agricultural College. The site of the old Agricultural School at Bible

Hill, Truro, was selected as the location of the new institution. There, in February, 1905, the present College of Agriculture was formally opened with a staff consisting of M. Cumming, B.A., B.S.A., Principal; H. W. Smith, B.Sc., (former Principal of the Agricultural School), Professor of Biology; F. C. Sears, M.Sc., (former Principal of the Horticultural School), Professor of Horticulture; F. L. Fuller, the former Farm Superintendent, and J. P. Landry, former Poultry Super-

The College at Truro is supported entirely by the Nova Scotia Government, assisted, however, since 1913, by a grant from the Federal Government under the provisions of THE AGRICULTURAL INSTRUCTION ACT. At the same time, ever since the doors of the institution were opened, students from the other Maritime Provinces have been received on the same basis as those from Nova Scotia itself. Approximately two-thirds of the students hail from Nova Scotia and the bal-



HORTICULTURAL BUILDING AND GREEN HOUSES, NOVA SCOTIA AGRICULTURAL COLLEGE
Erected out of the Federal Grant

intendent, each in the same capacity in the new institution.

The first class held was a short course class conducted in February, 1905, with an enrolled attendance of 68. The first regular course class was commenced on October 15th, 1905, with an enrolment of 17. As an indication of the growth since that time, the figures of 1913, the year before the war, were, for the regular course, 114, and, for the short course, 350.

ance from New Brunswick and Prince Edward Island. The maritime character of the institution is epitomized by the title of the students' magazine, first published in 1906—"The Maritime Students' Agriculturist."

THE REGULAR COURSE

For several reasons, the main of which was the judgment of the staff that they could the better serve the real purpose of agricultural educa-

tion by a course that would place the majority of the students on the farms of the East, the regular course at the College is a two-year or Associate Diploma course. This plan of confining the course to two years was facilitated by the fact that arrangements were entered into with the Ontario Agricultural College and Macdonald College by which graduates of the two-year course in Nova Scotia are permitted to enter, *ad eundem gradum*, the third year at these institutions. The arrangement up to the present time has

tive branches in the Department of Agriculture, thereby effecting economy of expense and concentration of effort, which, thus far, has worked out to the advantage of both the College and the general provincial work in the province. It may be, however, that the idea of a College of Agriculture, of Maritime scope in every sense of the word, which is now being discussed in the provinces interested, may be brought about, in which case it is altogether likely that a four years' bachelor's course, similar to that conducted at other agri-



CELERY ON THE HORTICULTURAL FARM, COLLEGE OF AGRICULTURE, TRURO

proven very satisfactory, affording, as it does, Maritime Province boys an opportunity to take their first two years' work under the local setting at Truro, and to take the balance of their course at the older established colleges, the equipment of which could not be duplicated at Truro without a large additional expense. From the standpoint of provincial agriculture this two-year course arrangement has made it possible for the senior members of the College staff to act as heads of their respec-

cultural colleges will be arranged.

The figures of the past ten years show that out of 445 students who have entered the regular course at the College at Truro, approximately 50 have continued their studies at either Macdonald or Guelph. How many of these would have been lost to the Maritime Provinces it is hard to state, for the war has claimed the services of a majority of them, and one cannot tell what percentage would have returned to their home provinces.

The regular course embraces practically the same subjects as are taught in the corresponding two years' course at either Guelph or Macdonald. Since most of the readers of THE AGRICULTURAL GAZETTE are familiar with the courses at these institutions it is unnecessary to further describe the course at Truro.

is only about one-tenth of the constituency of such a college as the Ontario Agricultural College, the size of the classes becomes all the more noteworthy. The instruction at this short course is comprehensive, embracing all the phases of practical agriculture which are studied in the regular course, and, as two or more classes are being con-



EXPERIMENTAL POTATO PLOTS, HORTICULTURAL FARM, COLLEGE OF AGRICULTURE, TRURO

THE SHORT COURSE

Each year during the first two weeks of January a short course of two weeks' duration is held, and it is always a very prominent feature of the year's programme. For a number of years the enrolled attendance has varied from 250 to 350, practically all hailing from the province of Nova Scotia, for the other Maritime Provinces now conduct short courses of their own. When it is considered that the constituency from which this attendance is drawn

ducted during practically all the time, the student often finds it to his interest to take one special course of classes one year and to return another year for the course of classes which he was not able to attend the previous year. So popular have the short-course classes become that the College is known from one end of the province to the other, and even in the most remote localities, mainly because of these popular short course classes. Latterly, the members of the faculty have taught at a number

of short courses held at various centres in the province, and these short courses have proven extremely popular wherever held. Nevertheless it is impossible to provide as satisfactory equipment for instruction at any of the outlying points as at the College itself; hence numbers still continue to respond to the annual call for short course classes at the College at Truro.

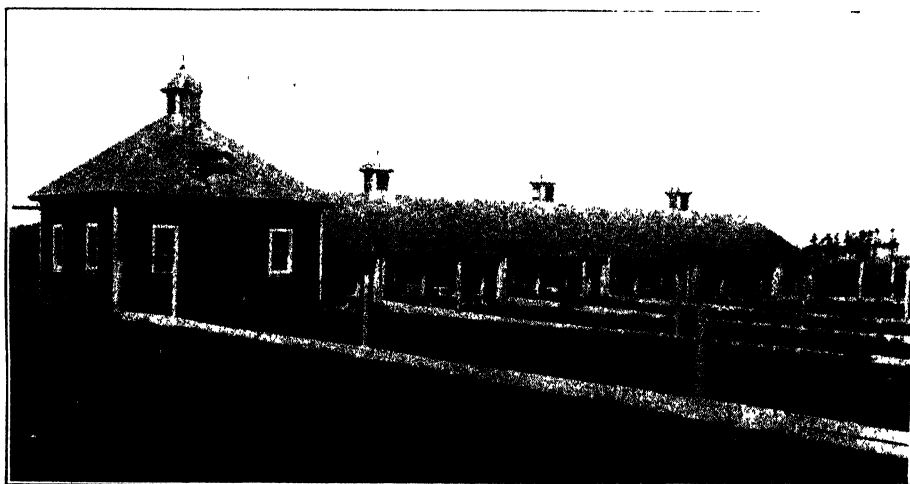
THE BUILDINGS

There are on the College campus five buildings used for instruction purposes; the Main building, the

and small fruit growing, and also a poultry farm equipped with permanent and moveable buildings and all the fittings of a modern poultry plant.

BENEFICIAL EFFECT OF THE AGRICULTURAL INSTRUCTION ACT

Perhaps to no other institution in Canada has the Federal Government grant under THE AGRICULTURAL INSTRUCTION ACT meant more than to the College at Truro. Since the first grant was given in 1912, the staff has been materially increased and strengthened. The Horticultural

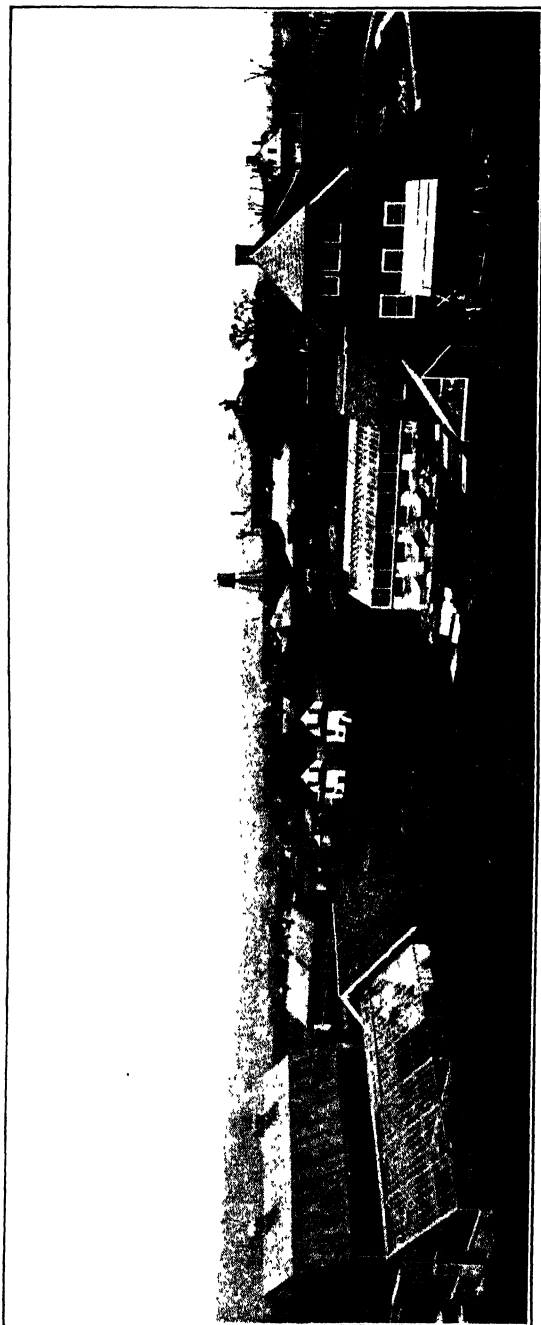


THE MAIN POULTRY HOUSE AND YARDS, COLLEGE OF AGRICULTURE, TRURO

Science Building, the Horticultural Building, the Dairy Building, and the Live Stock judging Pavilion. The equipment of these buildings is up to date and compares favourably with the equipment in similar buildings at other agricultural colleges.

In connection with the College there is a general live stock farm of some 390 acres with modern stables, barns and piggeries. The live stock consisting of cattle, horses, swine and poultry, is all of a high order. In addition there is a horticultural farm of some 25 acres, comprising orchard land and areas for vegetable

and Science buildings and a substantial addition to the main building have all been erected. In fact, from a college with barely enough accommodation for its own province students, and with little laboratory facility for research, the College at Truro has grown into a full-fledged, well-equipped institution capable of accommodating for many years to come all the regular course students from the Maritime Provinces. Moreover, investigation work is now being carried on in fields and laboratories which promises its full fruition to the agriculture of the East. No



A GENERAL VIEW OF THE MAIN BUILDINGS, COLLEGE OF AGRICULTURE, TRURO

doubt some of this development would have taken place had the Federal grant not been available, but the fact remains that the major part of the development has been financed from this fund.

Of course there are lacks. There is not, for example, a dormitory, although fortunately the students are able to secure satisfactory board in private houses in the town of Truro. And there are lacking other buildings which it is hoped will be erected some day. Never-the-less, even with no further additions, the College staff are now in a position to do the very best work.

THE WOMEN'S DEPARTMENT

The line of work ready for most development at date is the Women's Department. There is in connection with the Department of Agriculture a live Women's Institute organization presided over by Miss Jennie A. Fraser. Moreover, for some years, short-course classes of two weeks' duration in Domestic Science and allied subjects have been conducted at the College. A big forward stride was made when in the new Science Building, completed this year, domestic science labora-

tories and class rooms were provided. Had it not been for the war further measures would have been taken, but in the meantime future plans of development are being held in abeyance.

ELEMENTARY EDUCATION

Nor is the attention of the staff directed solely to the education of adults. In point of fact elementary education is receiving more attention each year. Annually in the month of July and August a Rural Science School is conducted jointly by the members of the Normal College and Agricultural College staffs. This school is attended by teachers of the province who are seeking to improve their knowledge of Nature Science with a view to teaching it in the schools. In addition to this, throughout the winter months, members of the College faculty lecture on their respective subjects to the students of the Normal College. Thus, gradually, the leaven of advanced agriculture is being placed in the schools of the country, where it will gradually leaven the whole life of the province of Nova Scotia and prepare the way for bigger things than ever along agricultural lines.

NEW BRUNSWICK

SEED SELECTION AND SEED FAIRS

BY J. B. DAGGETT, SECRETARY FOR AGRICULTURE

THE matter of seed selection in the province of New Brunswick did not receive very serious or general attention, either by the Government of the province or the farmers, until 1910. Previous to this a few local seed fairs had been held. The exhibits were not of a high order and but little interest was taken.

In 1911 the first real seed fair worthy of particular mention was held, in connection with the Farmers'

and Dairymen's Association at their annual session. From that time on there has been a steady increase in the interest and a marked improvement in the exhibits. The seed fair has become an important factor at the annual meeting of the Farmers' and Dairymen's Association.

In addition to the Provincial Seed Fair there were held last year fairs in the following counties: Victoria, Carleton, Kings, Westmoreland, York, Madawaska, Kent and Glou-

cester. It is purposed to pursue the policy of enlargement until fairs will be held in every county in the province.

ing seed growers and bringing them in competition and touch with one another.

CRIPPLED BY ENLISTMENTS

In carrying on this work the Department finds itself considerably handicapped because of the fact that Mr. Robert Newton, who had charge of this Division, together with his assistant, Mr. B. T. Reed, are at present engaged in military service overseas. We also find that, so many of the young farmers having enlisted in the same service, the interest in seed fairs is not so great as in previous years. We are hoping however, for an early closing of the war and that our staff may be returned to us, as well as our farmers, so that this work may be pushed forward as energetically as we had intended.

The object of the county fair is to bring as many local competitors together as possible. After the county fairs have been held the Provincial Seed Fair is put on, with the object of bringing together from every part of the province our lead-

QUANTITY AND QUALITY

The growing of our own seed and the raising of the standard required for entry in the seed fair competitions, are doing much to solve the weed problem. The judges have very clear instructions from this Department not to consider an exhibit unless it is reasonably free from noxious weeds and the general character of the exhibit up to a reasonably high standard. During the past three years the exhibits have increased over one hundred per cent, and the judges report that there has been a corresponding improvement in the character of the exhibits. There is evidence on every side that the policy pursued in connection with our seed fairs is having an excellent effect upon the crop production throughout the province. The watchword of the Department in this connection is "quality" rather than "quantity". Quantity, we believe, will settle itself when the quality is right.

ONTARIO

SUCCESSOR TO PROFESSOR J. B. REYNOLDS

DR. O. J. Stevenson has been appointed professor of English at the Ontario Agricultural College as successor to Professor J. B. Reynolds, now President of the Manitoba Agricultural College. Dr. Stevenson has had a wide experience in teaching, having filled the positions of public school teacher, public school inspector, high

school principal, teacher in the normal school and as a member of the faculty of education of Toronto University. During a short period he was Associate Professor of English at Queen's University. Dr. Stevenson is author of the Ontario High School English Grammar and the Ontario High School English Composition.

MANITOBA

CO-OPERATIVE FATTENING OF FARM CHICKENS

BY M. C. HERNER, PROFESSOR OF POULTRY, MANITOBA AGRICULTURE COLLEGE

THE co-operative fattening of farm chickens, which was carried on last fall at the poultry department of the Manitoba Agricultural College, proved very gratifying. Upwards of seventy farmers located in different parts of the province participated in the work. All told fifteen hundred and sixty-seven chickens were sold, bringing a total of \$1,559.00, or approximately one dollar a piece. About seventy-five old hens were sent in which reduced the average price considerably. The highest price received for No. 1 stock was twenty-five cents per pound, and the lowest twenty cents; the highest price received for No. 2 stock was eighteen cents per pound, and the lowest sixteen cents. These prices were for carcasses with heads and feet on and undrawn. About seventy-five per cent of the carcasses graded out No. 1 stock. The first chickens were received October 9th, and the last lot came in early in January. Throughout the entire period of this work good gains were generally made, but in a few cases there were practically no gains at all. The best gains were made where the chickens weighed about four pounds each. Where they exceeded this weight, the gains were correspondingly lower. One lot of fifty Buff Orpingtons gained 81 lb. in three weeks. In a number of instances where smaller lots were sent in the gains were even better.

THE FEEDING

Plymouth Rocks, Wyandottes, Orpingtons and Reds were sent in, many of them being pure bred. The Barred Rocks were probably more

satisfactory on the whole than any of the other breeds in that they ate well through the fattening period, made good gains, and dressed out the largest percentage of No. 1 stock. Some Leghorn and Leghorn crosses were sent in, but they were unsatisfactory from a feeder's standpoint. The rations fed consisted of two parts of oats, one of wheat, one of barley by weight. These were mixed and chopped fine, and sufficient buttermilk was added to make a batter that poured nicely. At the beginning of the fattening period the chickens were fed sparingly, but the quantity was increased gradually so that at the end of a week they received all they would eat up clean in thirty minutes. They were fed twice a day at regular intervals. The last week of the fattening period melted tallow was added to the batter at the rate of one ounce to every four chickens once a day. This helped to produce a whiter, fatter, and better roasting carcass.

SHIPMENT AND CHARGES

Farmers had to supply their own shipping crates, but instructions were given on the size and type of crate to be used. Consignors were required to state the number sent, their weight and the breed. On receipt of the shipment at the poultry plant the birds were weighed, counted and put in numbered sections in the fattening crates. An entry was made of these items along with the owner's name. After they were properly fattened they were killed, dressed and marketed as milk fed, crate fattened chickens, and usually sold at a premium. After this the

farmer received his first payment. In the early part of the fall this was at the rate of fourteen cents per pound, live weight, when they were taken out of the fattening crates. Later on when market prices declined somewhat the first price paid was a little lower. We usually aim to pay a cent or two per pound higher than the ordinary market price, live weight, thus giving the farmer an inducement to send his chickens to the fattening station. Besides paying him this premium he had a chance to realize on the gains that the chickens might make while in the fattening crates. At the end of the fattening season the farmer received his second payment after all expenses for handling his chickens had been charged up against him. The cost of feed and labour was ten cents per chicken, the cost of killing and plucking was five cents each, and cartage one cent each; or a total of sixteen cents for handling each chicken.

Coops containing live poultry for market or consumption must have sides, ends, and tops slatted. Tops with slats more than $1\frac{1}{2}$ inches apart must be protected by wire netting. Coops containing chickens or ducks must not be less than 12 inches, nor greater than 16 inches in height, for each tier of birds. Coops

containing turkeys or geese, must not be less than 16 inches nor more than 22 inches in height for each tier. Coops must not exceed 30 inches in width and 48 inches in length. Shipments of live poultry in broken or weak jointed coops and coops not conforming to these measurements are refused.

TURKEYS INCLUDED THIS YEAR

Last season's work was confined entirely to chickens of the heavy breeds. No Leghorns, old hens, ducks, geese, or turkeys were accepted, but in spite of precautions quite a few old hens were shipped in. Since the work was so satisfactory from the farmers' standpoint we have decided to include turkeys this year. They will be taken, and fattened on the same basis as chickens with probably an additional charge for the extra feed and labour required. But positively no Leghorns, old hens, ducks or geese will be accepted. This season we will be ready to receive chickens early in September, providing they weigh three pounds or over. Turkeys will be received any time after October 1st. The demand for chickens is likely to be very good this fall. In turkeys there is a shortage, and the demand will probably be good and prices high.

"What is farming?" asks the *New Zealand Farmer*, and then it answers its own question by saying:—

"Farming is not breaking clods; farming is not moving soil; farming is not ploughing—these are some of the little bits of inevitable, unavoidable experience and labour. Farming is gathering sunshine, preparing the soil and the seed that the plant may come and, spreading its leaves, gather in sunshine and strength from Mother Earth. This is better than speculation or making money on the Stock Exchange, whereby the other fellow becomes poorer. It is gathering and humanizing for the service of the race the great unused powers of Nature."

SEED GRAIN FAIRS

BY S. T. NEWTON, SUPERINTENDENT OF AGRICULTURAL SOCIETIES

THE Seed Grain Fair has been for several years a very important part of agricultural society work, and fully half of the seventy societies hold an annual seed grain fair.

For several years a dressed poultry show has been held in conjunction with the seed grain fair, and as December proves the most suitable month for the poultry show, practically all the seed grain fairs are held between December fifth and twentieth.

Of late years an increasing number of societies have added butter and vegetables, and at several fairs a fine display of live poultry was held, and at the present time there is a strong sentiment toward holding a soil products exhibition during the winter, since on account of the short season between threshing time and the freeze up, most of the fairs are held during July when the weather can generally be counted on to be fine, and, as a consequence, poultry, vegetables, and dairy products cannot be shown to advantage at that time.

The Provincial Soil Products Exhibition is held at the Agricultural College, Winnipeg, during bonspiel week, when the winning grain from all the local fairs is sent, and judges are secured from other provinces, as the competition is particularly keen. Last year in the sweepstakes for the province there were forty entries.

A very noticeable feature of recent fairs is the extent to which Marquis wheat is supplanting Red Fife wheat. At the last fair the eleventh prize

in Marquis was scored higher than the first in Red Fife.

For convenience in judging the province is divided into three districts for wheat, oats and barley, the three highest competing for the provincial sweepstakes. In the other classes such as peas, flax, timothy, clover, rye grass, etc., the whole province is included.

Last year, while the same amount of money was paid out in prizes, the number of prizes was trebled, with the result that there were more than three times as many entries as in previous years.

For wheat, oats and barley at the coming provincial seed grain fair or soil products exhibition, the sliding scale which has proved so popular at the big summer fairs will be used in determining the number and value of the prizes.

Another feature of the coming fair will be the boys' section this year. Between 200 and 250 boys who are members of boys' and girls' clubs, are growing registered seed, and the majority will have entries at the big provincial fair.

There has been a slight falling off during the past two years in the number of local fairs held, some of the societies holding that the interest of the nation was best served by devoting the money formerly paid out in prizes to patriotic purposes. This year, however, indications seem to show that the motto of the various societies will be "business as usual", unless the black rust scare, which at this date appears to be very real, so affects the quality of the grain as to make a fair inadvisable.

BOYS' AND GIRLS' CLUBS

MANITOBA Boys' and Girls' clubs in 1913 had 750 members, in 1914, 1800, and in 1915, 5,500. In 1916, there have been enrolled upwards of 10,000.

This year the boys and girls were offered free eggs for chicken-raising work, and it took nearly 80,000 eggs to go around. This fall a plan is to be put into operation whereby the best chickens raised this year will be gathered into pens so that the pupils will be able next spring to supply the club members with pure bred eggs, for the poultry contest will be retained even though the free supplies provided by the Department will go to some other contest.

One of the contests calls upon the boys and girls to acquire young pigs of their own, and then rear them. The managers of the various branches of the Bank of Commerce took the personal note of each of the contesting young people who wished to borrow sufficient money to buy a pair of pigs. These pigs, together with other trophies of the clubwork, will be exhibited at the fairs in the fall; then the pigs will be marketed. That the boys and girls will have something to show for their summer's feed and care is doubly assured by the fact that already one firm has offered half a cent per pound above the prevailing price at that time. Some of the clubs have as many as 100 pigs.

MANUAL TRAINING SHORT COURSES

Through the Boys' and Girls' Clubs, the Extension Service of the Agricultural College has joined hands in many practical issues with over 10,000 boys and girls of the province, and to the boys who are in these clubs the Agricultural Woodworking short course presented in about 25 places in Manitoba this year, averaging from a week to ten days in duration, makes a strong appeal. In announcing the plan it was stipulated

that in order that any point might be favoured with a course it must enroll at least 15 or 20 boys who are over 12 years of age. Much of the work can be done out-of-doors, as well as indoors, but it is part of the plan that in each case access shall be had to some suitable building or room, so that work may proceed through rainy as well as fine weather. The arrangement at Souris presents a fine example of how the short course may be made a red letter week in the boys' lives. Here the citizens provide a big tent, and the boys camp for ten days, cooking their own meals, working with their own hands and enjoying a few fine sport features sandwiched in between. The instructors in charge of these 25 short courses are technical teachers either in the Agricultural College, or in the manual training departments of the Winnipeg public schools. The things made are such as a farm boy should know how to construct.

In the matter of tools the co-operative idea is being inculcated. The boys get together in groups of five, and by each boy furnishing two or three tools, quite a respectable kit for joint use is available. In some centres the girls are being given a course in sewing.

In connection with each course one sports day is arranged for, and at least one lecture on agriculture given by some member of the Agricultural College staff. At the close of each course study clubs are organized for the purpose of making a further study of agricultural subjects during the fall and winter months.

These are only a few of the facts about the work of the boys' and girls' clubs of Manitoba. A little later, when the canning season is over, there will be some interesting stories from the boys and girls who received the 5000 quarter pound packages each of peas and beans sent out to them by the Department this spring.

THE CRUSADE AGAINST WEEDS

THE Manitoba Weeds Commission in a widely distributed placard points out that Section VII of the Revised Provincial Weeds Act provides that

1. It shall be the duty of every person owning or operating a threshing machine immediately after completing the threshing of grain at each and every point of threshing, to clean, or cause to be cleaned, the said machine, together with all wagons and other outfit used in connection with such threshing, so that seeds of noxious weeds

shall not be carried to or on the way to the next place of threshing by the said threshing outfit.

2. Any person not complying with the provisions of this section shall be liable to a penalty of not less than twenty-five dollars nor more than one hundred dollars, and in default of payment to one month's imprisonment.

3. A printed copy of this section shall be affixed and kept affixed to every threshing machine by the owner or operator thereof while being operated in the province under a penalty of ten dollars for every failure or neglect to do so.

PLOUGHING MATCH RULES

THE following rules and regulations have been drafted by the Agricultural College Extension Service for use in connection with ploughing matches in Manitoba:

1. No person will be allowed to interfere with the ploughman except in the setting and removal of stakes, and no person will be allowed to accompany the ploughman.

2. Land to be ploughed will approximate $\frac{3}{4}$ acre for single furrowed ploughs and $1\frac{1}{2}$ acres for gangs.

3. Lands must be measured out and numbered consecutively before the time set for the match to commence.

4. Ploughman must be on the grounds before 10 a.m., at which hour lots will be drawn and stakes set. Ploughmen must finish by 4 p.m.

5. Each ploughman will have one strike-out and one finish.

6. In the strike-out all lands must be opened and all weeds cut.

7. Stakes must be set only once for the strike-out.

8. Five rounds complete the crown. The stake bearing the land number must be replaced as soon as the crown is finished.

9. The first two rounds thrown to the adjoining land are not judged. In case the neighbour's crown is crooked or otherwise defective, it is not necessary to conform to it.

10. Depth of furrows 5 inches; width according to the plough used.

11. A sole furrow must not be turned in finishing the land.

12. The use of gauge wheels and skimmers is permitted.

13. No pulling or covering of weeds with either hand or foot or tramping the land with the feet will be allowed. A man in each class will see that each ploughman conforms with the above rule. Every one not conforming thereto will be reduced one point for each offence.

14. Judges have the right to withhold a prize if they consider the work deficient in merit.

15. All protests must be in writing accompanied by a fee of \$2.00 and lodged with the Secretary before 6 p.m. on the day of the match.

16. Ploughmen who do not conform with the above rules will be disqualified.

SASKATCHEWAN

FARM BOYS' CAMP

BY F. H. AULD, ACTING DEPUTY MINISTER OF AGRICULTURE

THE second Farm Boys' Camp held in Saskatchewan was an important event in connection with the Saskatchewan Provincial Exhibition at Regina, July 24-29. In numerical strength the camp was similar to last year with an attendance of 186 boys in the charge of 19 agricultural secretaries from as many rural municipalities in Saskatchewan.

The first camp was organized in 1915 by H. N. Thompson, Weeds and Seed Commissioner for Saskatchewan, who is now "Somewhere in France." This camp just held was more truly a part of the exhibition than last year when the major part of the expense was met by funds collected or provided by the Canadian Credit Men's Trust Association, and the balance by entry fees of \$1.50 per boy. This year the expenses of the camp are being met from donations of \$250 each from the Canadian Credit Men's Trust Association and the Winnipeg Sub-section of the Canadian Bankers' Association, and \$100 from the Mortgage Loans Association of Western Canada. As the

purpose is to make the camp self-supporting as soon as possible the entry fee for 1916 was \$3 per boy, and the entry fees also are applied to the payment of expenses of transportation and board of the boys while in camp. The remainder of the expense will be paid by the Exhibition Association, which is as much interested in the camp for its educative value to the boys as for its "attraction" features to the fair.

The agricultural secretaries are municipal officials who devote their time to the administrative work of rural municipalities along agricultural lines, and use every opportunity to do work of educational value among boys and girls as well as adults. The College in connection with its extension work is charged with the responsibility of utilizing the services of the agricultural secretaries in furthering agricultural education, and the programme of the camp, which provided plenty of opportunity for hard study as well as healthful recreation, was carried out by the Saskatchewan College of Agriculture.

THE BETTER FARMING TRAIN

THE tour of the Better Farming Train was concluded at Al-sask on July 14th, and the officials in charge of the train, in reporting the uniform success of the meetings, were fully satisfied with the results. A total of 22,973 persons visited the train, composed of 8,245 men, 5,510 women, and 9,218 children. Last year there were two trains in operation, and it is, therefore, impossible to make a compari-

son of attendances. This year the train ran over Canadian Northern lines only, but in comparison with last year's Canadian Northern train the figures are 14,264, as against this year's total of 22,973, which shows a very large increase. The average attendance at the 56 meetings was 410.

This large attendance was doubtless due to judicious advertising. Several places declared a holiday to

allow the people an opportunity to visit the train. At Melfort the officials had the pleasure of entertaining 965 visitors, which is probably the largest crowd which has ever visited one of these demonstration trains on any one day. A most gratifying feature was the large attendance of school children. The

teachers, many of whom brought their pupils in a body to the train, realized that the time thus spent from school work, so far from being wasted, was full of profit and instruction, while the keen and intelligent interest taken by the youngsters in every branch of the work was a constant surprise to the officials.

ADDITIONAL HAIL INSURANCE

THE Municipal Hail Insurance Commission, in accordance with legislation passed at the last session of the legislature, has this season inaugurated a system of co-operative, or mutual insurance, whereby a farmer whose crop is situated in a rural municipality, under The Hail Insurance Act may procure insurance to the extent of \$5 per acre in addition to the \$5 provided for by the four cent assessment made by municipalities which have passed the Hail Insurance by-law.

Agents have been appointed to solicit business for the Commission in all of these 139 rural municipalities, and the reception given by the farmers to this new system will insure a wide distribution of the risk. The Commission, however, has completed arrangements with several good companies whereby a portion of the risk can be re-insured where the amount of insurance applied for is greater than is considered safe to carry. This arrangement has been carried out in a number of districts, wherever in fact it was considered that there was even a slight risk of overloading, while in other districts where the farmers taking this additional insurance were more isolated and scattered it was not considered necessary to effect re-insurance.

The rate charged for the additional hail insurance is 5 cents per acre for each dollar of insurance, which is one cent per acre less than is usually charged, but the Commission cal-

culates that its administration expenses are so low that the deficiency in revenue caused by the reduction of one per cent in the rates will be easily made up.

Up to the present time approximately \$2,000,000 of additional insurance is being carried, by which it will be seen that the scheme has been well received, and its initiation timely and popular. Losses incurred so far are if anything less than might reasonably be expected at this time of the year, so that there is at present every prospect that the additional hail insurance scheme will have a substantial surplus with which to commence operations next year. It is intended to hold 50 per cent of this surplus in a reserve fund, and to use the other 50 per cent in the payment of dividends to the assured on the basis of the premiums paid.

A few facts showing the present standing of the Commission are appended:—

Losses paid to date nearly	\$2,000,000.00
Surplus	544,825.82
Estimated Current Year's Revenue	1,000,000.00
Municipal Insurance in force at \$5.00 per acre	30,000,000.00
Additional Insurance in force	2,000,000.00
Revenue from Additional Insurance	100,000.00

These figures show the extent of the success of the Municipal Hail Insurance Commission as a farmers' co-operative insurance organization.

THE REGINA EXHIBITION

ALTHOUGH the conduct of the Regina Exhibition lies naturally quite outside the scope of the Government's activities, it is nevertheless keenly interested in the success of the exhibition and many government officials acted on committees entrusted with the gathering of exhibits, while several departments were themselves exhibitors.

Taking the Department of Agriculture first, their exhibit of model farm buildings, farm appliances, and devices of various sorts attracted much admiration; the consignments of wool from those who took part in

the co-operative wool marketing scheme were just in time to form a splendid exhibit; the Department was the originator of the very successful Farm Boys' Camp, and the dairy branch was responsible for the sending in by the respective co-operative creameries of an excellent collection of dairy products.

The Department of Education had much to do with the fine display of products from school gardens. This Department also had on view a most elaborate and beautifully made model of a country school, showing the school house, teacher's house, barn, school garden and playground.

BRITISH COLUMBIA

THE NEW MINISTER OF AGRICULTURE

UNTIL last June the Ministry of Agriculture in the provincial cabinet had been united with some other ministry. In June of this year it was created a separate and distinct Department and the portfolio entrusted to the Hon. William Manson, who became British Columbia's first Minister of Agriculture. Mr. Manson has been in public life since 1896, filling during the last twenty years many posts of usefulness. He was born in Shetland Island July 4th, 1867, and is consequently in his fiftieth year. He was educated at the public school at his native place and came to Canada in 1887, settling at Comox, this province. In 1889 he became an accountant in Nanaimo. He filled the office of school trustee from 1896 to 1907 and was also alderman in 1898, 1899, and 1900. In 1901, he was elected mayor of Nanaimo

and served in that worshipful capacity four years. In 1905 and 1906, he was a member of the provincial legislature and for a time was Provincial Secretary in the McBride Government. In the fall of 1907, he accepted the position of Government Agent and Stipendiary Magistrate at Port Simpson. Having moved his official offices to Prince Rupert, he took up his residence there. In 1909, he resigned his agency and magistracy and was again elected to the provincial legislature. In 1911, he became mayor of Prince Rupert, filling the dual positions of mayor and provincial member until his present appointment. In April of this year he was appointed Superintendent of the Agricultural Credit Commission, a body constituted under the provisions of the provincial Agricultural Act, 1915.

NOTES ON THE UNIVERSITY AGRICULTURAL WORK

BY L. S. KLINCK, B.S.A., DEAN OF THE COLLEGE OF AGRICULTURE

DURING the past year considerable preparatory work has been done on the agricultural college site at Point Grey. Up to the present ninety acres have been cleared and prepared for cropping. Of this area sixty acres have been put in with green manure crops and the balance will be sown this fall. As the growing season is a long one we shall be able, on all land prepared in early spring, to turn under two green crops during the summer and still have ample time to obtain a good growth of some fall-seeded crop such as fall rye or hairy vetch. That this forecast is not unduly optimistic is shown in the fact that at the time of writing, July 18th, the second crop on a block of eight acres is well headed out and is now being turned under.

A BOTANICAL GARDEN

In addition to the land cleared for the initial work of the Animal Husbandryman, Horticulturist and Agronomist a considerable area is being prepared for a botanical garden. During the past four years Mr. John Davidson, Provincial Botanist, has been making a collection of the native flora of British Columbia. This collection, which is now at Essondale, will be transferred to the university campus this autumn. As upwards of twenty-six thousand specimens, representing nearly eight hundred species, are included in this collection, the Department of Botany comes into possession of a valuable nucleus for a botanical garden.

Sufficient funds were voted at the last session of the Legislature to enable a beginning to be made in the erection of suitable farm buildings and in the purchase of live stock and equipment.

SHORT COURSES

Regular courses leading to the degree in agriculture will not be offered during the coming academic year, but it is hoped that a series of short courses will be given. For the accommodation of the students temporary buildings are being planned. The course on "The Scientific Basis of Agriculture", which was offered as an elective to junior and senior students in arts last year, is included in the list of electives for the coming year.

ADDITIONAL STAFF APPOINTMENTS

During the past week two additions to the agricultural staff have been announced. Mr. F. M. Clement, B.S.A., who for several years has been director of The Horticultural Experiment Station at Vineland, Ontario, has been appointed Professor of Horticulture, and Mr. P. A. Boving, B.A., Cand. Agr., who for the past three years has been in charge of root investigations at Macdonald College, P.Q., has been made Assistant Professor of Agronomy. Negotiations are also under way looking to the appointment of a man in Animal Husbandry.

AGRICULTURAL LEGISLATION

THREE measures effecting agriculture and the land were passed at this year's meeting of the legislature of British Columbia. The first is an Act for the Regulation

of Creameries and Dairies, the second Respecting the Marking of Eggs, and, the third, to provide Homesteads and Homestead Loans for Returned Soldiers.

The Act for the Regulation of Creameries and Dairies provides that every such establishment must be licensed; that no creamery or dairy shall permit any milk or cream to be tested save by an Inspector licensed under the Act; that the value of the milk and cream shall be certified to by an Inspector; that the terms of the licenses shall be determined by Order-in-Council; that every Inspector shall pass an examination and shall be governed by regulations under the Act; that the Minister of Agriculture may prescribe the testing machinery and equipment to be used; that the Minister of Agriculture may make rules and regulations to be approved by Order-in-Council, and that the penalty for breach of the Act shall be a fine of not less than twenty dollars and not more than one hundred.

THE MARKING OF EGGS

The Act Respecting the Marking of Eggs enacts that for the purposes of the Act "cold storage eggs" shall mean eggs that have been in cold storage within the Province for not less than 90 days; that "preserved eggs" shall mean eggs in which deterioration has been arrested, prevented or retarded; that "Chinese eggs" shall mean eggs imported from China; that "mark" or "marked" shall mean legibility in gothic letters and in durable ink; that "first grade eggs" shall mean fresh eggs that can be used for boiling, and that "cooking eggs", or "second grade eggs", shall mean eggs suitable only for cooking. The Act goes on to provide that every case of eggs shall bear a placard showing in at least four-inch letters the grade and place of origin of the eggs; that a legible sign shall be conspicuously displayed in any place where "Chinese eggs" are offered for sale; that inspectors shall see that the provisions of the Act are obeyed, and that a penalty of not more than one hundred dollars shall be incurred by infringement of the Act.

RETURNED SOLDIERS

The Soldiers' Homestead Act describes a "returned soldier" as a person who enlisted in British Columbia, or was a resident of that province at the time of enlistment for service in the war, and who returns to a domicile in the Province. It is also provided that women and minors who enlist in any branch of the service, and the widow of any soldier who, if living, would be entitled to claim under the Act, shall be included within the definition "returned Soldier". The interpretation section of the "Agricultural Act, 1915," is made to apply to this Act, subject to certain specified provisions. Lands are to be especially reserved and allotted for the purposes of the Act and the "returned soldier" must file his application within eighteen months from the date of his discharge. It is further provided that no returned soldier shall be called upon to pay any price or amount other than the fee of ten dollars for the Crown grant; that such pre-emption shall be exempt from all taxation except school taxes, and shall be exempt from seizure or execution for debt for a period of five years from the date of the pre-emption record; that the Crown grant shall not issue for five years from the date of record, and that no transfer or assignment of a returned soldier's interest in same shall be legal prior to the issuance of the Crown grant.

THE QUESTION OF LOANS

All purchase moneys arising from the sale of land under the Act, after deducting the expenses of sale, are to be paid over to the Agricultural Credit Commission, who shall take and use such money for the purpose of making loans to returned soldiers to be used in making improvements on their pre-emptions, and for any of the purposes for which loans may be made under the "Agricultural Act, 1915"; provided that in any regula-

tion made under this Act special provision may be made defining the terms upon which an initial loan may be made to returned soldiers to enable them to commence work on their pre-emptions.

The Agricultural Credit Commission is authorized and empowered to make necessary uses, exchanges and transfers of funds to give effect to the provisions and intent of the Act.

THE AGRICULTURAL ESTIMATES

The estimates called for by the Department of Agriculture for the year ending March 31st, 1917, are as follows:—

Salaries	\$ 73,496
Administration and Outside Service (including products for Departmental exhibition and miscellaneous expenditure)	20,000
Board of Horticulture—expenses of members attending meetings	500

Crop Competitions in commercial fruits and vegetables, and gardens, and vacant lot competitions and demonstrations . . .	2,000
Demonstration orchards and experimental trees	1,000
Fruit-handling, cold storage and precooling investigation work . .	1,000
Fruit Packing Schools	1,500
Agricultural Associations . . .	30,000
Dairymen's Association . . .	2,500
Entomological Society . . .	250
Fruit-grower's Association . . .	5,000
Poultry Association . . .	2,500
Stock-breeders' Association . . .	2,500
Flockmasters' Association	250
Farmers' Institutes (including educational work)	20,000
Women's Institutes (including educational work)	7,500
Inspection of Nursery-stock, trees, plants, etc	20,000
Suppression of diseases affecting fruits, vegetables, plants, etc	15,000
Suppression of noxious weeds	10,000
Compensation to owners of cattle slaughtered for tuberculosis . .	10,000
Travelling expenses of officers on duty . . .	25,000
Total . . .	\$ 249,996

At a recent meeting at one of the State colleges, where a group of club boys and girls were gathered, with a large number of teachers and county superintendents, a professor in the institution was scheduled for a demonstration. He was a master of his subject, but his first words revealed the fact that, instead of a demonstration, he planned to give the boys and girls a "good talk." When he had spoken for five minutes, the entire audience became restless. The extension director became restless also, and at a convenient pause interrupted the speaker by remarking, "Professor, that was an excellent talk; we are now ready for that demonstration." While the speaker was somewhat nettled at this suggestion, he soon began to unpack his equipment. Instantly the audience was all attention, and when several of the youngsters were called upon to assist, the interest ran high. When the period closed, the boys and girls, teachers and superintendents had not had enough. They swarmed on to the platform, asked questions, wrote down names and addresses, made rough sketches of the equipment, and thanked the demonstrator.

The extension director who ventured to interrupt knew that the day of a "good talk" in extension work is passing, and that the demonstrator has taken the place of the platform lecturer. —*Farm Demonstration Monthly.*

PART III

Rural Science

RURAL LIFE CONFERENCES

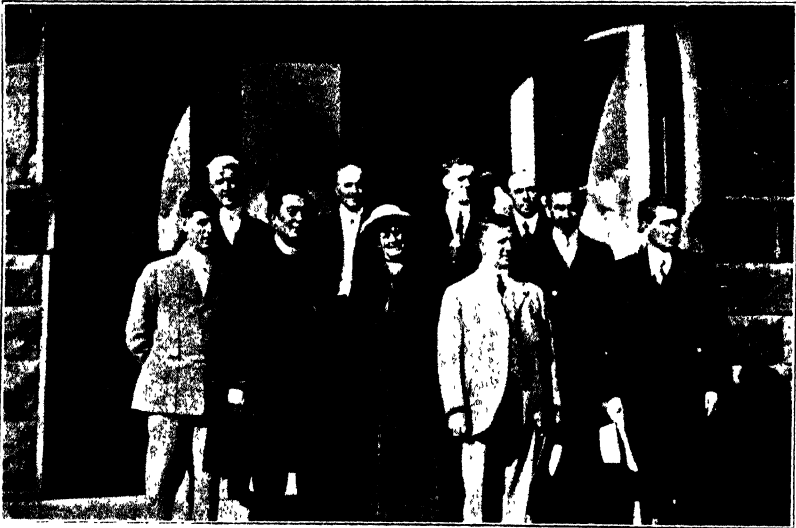
PRINCE EDWARD ISLAND

BY W. R. REEK, B.S.A., DIRECTOR OF AGRICULTURAL INSTRUCTION

PROBABLY in no other province do the clergy participate so actively in agriculture as in Prince Edward Island. However, only in sections are phenomenal results attained, and to bring these

Island, were the principal reasons for calling the conference.

The original idea was to throw every session into discussions, and prominent local men who were familiar with conditions were invited to



SPEAKERS AT THE RURAL LIFE CONFERENCE, CHARLOTTETOWN

From left to right: J. E. McLarty, S. B. McCready, Rev. Dr. Gauthier, Hon. Murdock McKinnon, Miss E. J. Guest, W. J. Reid, Dr. G. C. Creelman, Rev. W. J. Smith, P. Barlow, J. A. Clark

more prominently before all and to bring about a more concerted action on the part of all the clergy upon public questions which were conducive to the improvement of the

attend and take part. Dr. G. C. Creelman of Guelph, Principal Cumming, Truro, N.S., Thomas Adams, Commission of Conservation, Ottawa, Rev. W. J. Smith, Rev. W. A.

Riddell and Miss E. J. Guest, of Toronto, were invited to deliver addresses.

Premier Mathieson, Hon. W. A. Pierce, and many others, assisted at the various sessions.

Co-operation was the theme permeating the conference; its application to agriculture and education was particularly dwelt upon. Every speaker endeavoured to impress the idea that in no other way would our schools become what they should be; would our products successfully compete in the world's markets, or would the social life in the rural districts linked with the monetary returns be sufficient to induce the growing generation to choose agriculture as a profession. Many strongly advocated that the leaders themselves must co-operate more closely. That many local jealousies must necessarily be eliminated, that the differences in creed and race must give way to patriotism and that all should work for the uplifting of the district, because in such action only the nation would become stronger. Active, well trained leaders are a necessity; the discussions threw out many ideas concerning leadership.

Standards in agriculture and education were topics of unusual interest, the idea that we were setting our own standards under which to measure our attainments was lucidly explained by Reverends Gauthier and Fullerton. That we were not comparing or studying closely enough movements in other places, accounted for many activities that existed and which should have been replaced by more modern systems.

The summer school for teachers was in session and the members were invited to attend all the meetings. The school inspectors were also present. Clergymen gathered in as convenient and at one session fifty were present. Many of the citizens of Charlottetown took advantage of the

opportunity and attended regularly. The attendance at the largest session was 450 and the least was approximately 200. Probably no more fertile minds than those of the teachers could have been gathered together for such a conference, because the successful application of the many principles discussed depends largely upon the teachers.

Dr. Geo. C. Creelman discussed agricultural conditions as he saw them as compared with other districts and advocated a closer trade connection with the larger provinces in Canada. Particularly, did he emphasize the lack of waste land and the great opportunities for dairying and sheep raising. He also gave his travel talk describing the countries of New Zealand, Australia and others.

Miss Guest emphasized the great need of more careful training of the boys and girls during the "teen" age, and outlined a system whereby great assistance could be rendered, not by teachers only, but by parents.

Principal Cumming, who has a wide experience in maritime agriculture, threw out practical hints re the use of lime.

Reverends Smith and Riddell attended in order to give the conference the result of their many years of study of conditions in all places where all classes are met. The result of this was that concrete methods were placed before the teachers which could be placed in operation without too much effort and by the person of average ability.

Thomas Adams of the Commission of Conservation reviewed conditions as he saw them throughout Canada, emphasizing the need for conservation and development.

The result of greatest import was that teachers and preachers were brought face to face with conditions; remedies were suggested and procedure outlined.

This conference was made possible through the provisions of THE AGRICULTURAL INSTRUCTION ACT.

ONTARIO AGRICULTURAL COLLEGE

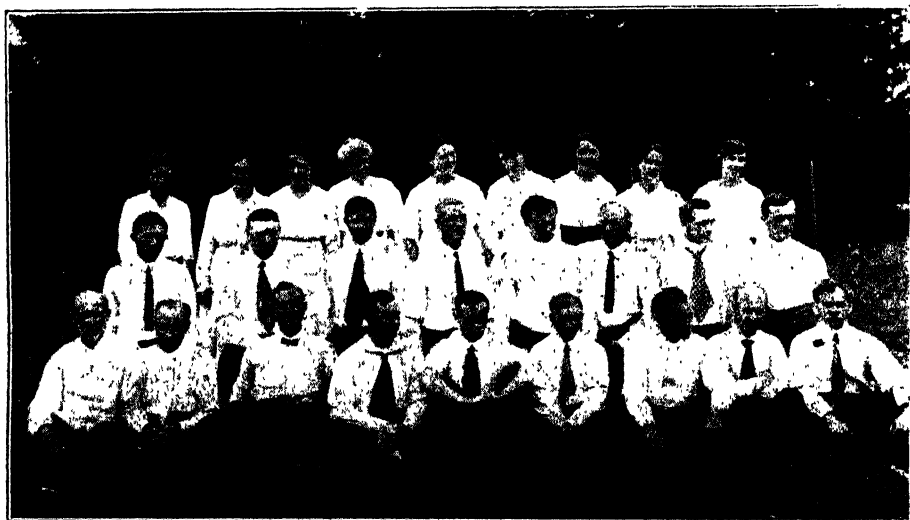
SCHOOL FOR RURAL LEADERSHIP

BY N. A. CAMPBELL

THE class of 1916 in the School for Rural Leadership at the Ontario Agricultural College, Guelph, comprised thirty members, half of whom were clergymen. During the morning sessions from 9 to 12, lectures were given along the lines of community work. The subjects treated were: "The Rural Church" by Prof. Earp; "The Rural Home", by Prof. Murchie, and "The Rural Playground", by Prof.

ing by Prof. Dean, and Animal Husbandry by Prof. Day. These are all practical farm subjects and will put the class in sympathetic touch and intelligent union with the farmers and farmer's wives and daughters of the rural community.

From 4 to 6 the class engaged in games on the campus, volley ball, captain ball, and indoor baseball being favourites, with tennis and bowling as alternatives. The leaders



RURAL LEADERS WHO ATTENDED THE SUMMER SCHOOL, O.A.C., GUELPH, 1916

Maclaren. A pleasing feature of the morning session was the five minutes recess between the lectures, when the class under direction of Mr. Maclaren engaged in earnest play, and each day learned two new games. There will be groups of happy children in rural Ontario when the twenty new games learned here shall be taken up at thirty new centres.

In the afternoon from 2 to 4, lectures were given on Chemistry of the Farm by Prof. Harcourt; Dairy-

became children again and childhood memories were revived, as were also many muscles unused since childhood's play days.

The evenings were spent mostly in social gatherings in the large and beautiful parlours of the College building. These gatherings, where leaders and teachers met, took the form of services of song, secular and patriotic songs, story telling, informal discussions of the school and the church, and the school as a

community centre. The final evening of the leaders' class there was a practical demonstration of the taste, flavour, and general toothsome-ness of the strawberries grown upon the farm.

The beautiful dining hall in which teachers and leaders assembled three times a day, lent itself to the pleasure of the occasion. Twice in the week the tables all changed and new acquaintances were made around the round dining tables that seated eight diners with comfort. The meals were well served, the menu varied, and the guests delighted.

Members of the class speak in glowing terms of the thorough enjoyment of the two weeks, and many rural centres in Ontario will profit

from the effort of the Ontario Agricultural College in thus gathering a band of leaders who may become inspired with the greatness of the task that faces them as workers in the open country, and comforted by the fact that a means of meeting that task hopefully is being provided. That the College, whose first aim is usually considered to be the raising of better crops and improved stock throughout the land, is also seeking that ulterior aim which, after all, is greatest, viz., better men and better women and, therefore, better homes and happier children and a brighter rural life.

The class of 1916 has reasons to thank the College and the lecturers for their splendid work.

MANITOBA AGRICULTURAL COLLEGE

SHORT COURSE FOR RURAL MINISTERS

BY R. W. MURCHIE, LECTURER IN RURAL SOCIOLOGY AT THE AGRICULTURAL COLLEGE

THe second annual short course for rural ministers was held in the Manitoba Agricultural College the last two weeks in July, when sixty registered for the course. This was considerably less than the number registered last year, when about a hundred ministers attended.

This year the privileges of the school were open to ministers' wives and quite a number availed themselves of the opportunity for recreation and study.

The course this year followed along the same lines as that of last year; the intention of the course being to give the ministers and their wives a sympathetic understanding of the problems with which the farmers and their wives are confronted. The ministers showed great interest in such problems as "The Fertility of the Soil," "The Prevention of Drifting," "Crop Rotations" and "Profitable Types of Cattle."

Perhaps the lectures given by C.

H. Lee, M.A., Professor of Bacteriology, aroused greater enthusiasm than any other. "The Relation of Microbes to Man" and "Practical Examples of the Uses of Bacteria" were the subjects of his lectures. Professor Harrison's lecture on "Crop Rotations" also created great interest and many questions were asked during the lecture. The ministers seem to have realized that they must know something definite about the problems of farming in the West, if they are to minister successfully to charges in the country.

Several addresses were given by President J. B. Reynolds, M.A. "Change and Progress" was the subject of his first lecture, and in it he depicted in a series of word pictures how all progress must come through change, evolutionary or revolutionary. This was followed by a lecture on "Changes in Country Life," in which he related the principles he had enunciated more par-

ticularly to agricultural conditions. He depicted the old self-sustaining community with its store-keeper, its blacksmith, its carpenter and its cobbler, and he traced the change to this age of mechanics and individualism and pointed forward to the time that must soon come when the community will again become self-sustaining through co-operative effort. In a lecture on "Rural Values" President Reynolds opened the eyes of the ministers to the higher and spiritual values of country life. "Farming," said President Reynolds, "did not offer a great financial remuneration." It was necessary to recognize this, but to recognize also the compensations. There is a certain truth in the complaint made that the farmers do not get a fair share of the products of their labours and capital, "but," President Reynolds said, "I am glad that farming is not financially profitable to such an extent as to lay it open to exploitation. Farming is like preaching, as soon as it becomes financially a good thing much of its usefulness departs."

Among the other sociological subjects dealt with were community problems, home problems, school and church work. Mrs. Bertha Dahl Laws, of Appleton, Minnesota, one of the finest institute lecturers from that state, brought the course to a

conclusion with a lecture on "The Influence of Women in the Home."

RESOLUTIONS ADOPTED

The following resolutions were passed and closed the course:—

We, who have been privileged to attend the course of lectures arranged by the Agricultural College Staff for the benefit of rural ministers and their wives, desire to place on record our appreciation of the helpfulness and stimulating effect of such a course and desire to thank President Reynolds and all the other lecturers who have given us the results of their scholarship and experience.

We desire to express also our thanks to those who have ministered to our needs in the dining hall and to our physical comfort generally and desire to place on record our appreciation of the recreation and social features introduced by Mr. Murchie, which have left nothing to be desired.

We also desire to express our thanks to the railway companies who have kindly favoured us with reduced rates.

The equipment of the college and its machinery to perform its appointed work has impressed us and we unhesitatingly recommend the curriculum to the consideration of those who are seeking a school for their sons and daughters, which may better fit them for life on the farm or for life anywhere.

We indulge the hope that we may be permitted to return a year hence to enjoy a similar course with its delightful experience.

We recommend to rural ministers that they co-operate with the school teachers in their districts in organizing the social and recreational life of their community.

NOVA SCOTIA

RURAL SCIENCE SUMMER SCHOOL

BY L. A. DEWOLFE, DIRECTOR OF RURAL SCIENCE SCHOOLS

THE summer session of 1916, Rural Science School, Truro, N.S., was successful from every point of view. Not only was the attendance greater than at any other session, but the quality of work done was proven to be continually improving.

The enrolment was 192. Of these, only 9 were men. There were 124 in the Junior Class; 59 in the Senior, and 8 doing graduate work.

Having completed the course this year, 46 were awarded Diplomas, and 61 obtained certificates good for an extra grant for a year. During the Session a number of outside lecturers gave evening talks on various subjects.

The Entomological Society met with the School for one day. A number of the students are members of this society.

SASKATCHEWAN

BETTER SCHOOLS DAY

BY A. W. COCKS, B.Sc., DIRECTOR OF SCHOOL AGRICULTURE

BY proclamation of the Lieutenant-Governor, Friday, June 30th, 1916, was declared a school holiday in order that meetings might be held in various centres for the purpose of studying and discussing the educational problems of Saskatchewan. Since that date reports of many meetings with copies of the resolutions which were adopted have been forwarded to the Department of Education.

With regard to points having reference to agricultural instruction in the schools conflicting opinions are very evident. By a consideration of over one hundred reports of meetings held on Better Schools Day, it has been found that the following met with the approval of those present at the various meetings: school gardens; agriculture as a subject of study; rural high schools; consolidated schools; municipal school boards; school fairs; improvement of school grounds by the planting of trees, shrubs, etc.; the training of teachers in agriculture; itinerant teachers for agriculture, manual training and household science; residential municipal agricultural high schools; small experimental farm and gardens in connection with the Normal Schools; compulsory school gardening; rural education associations and community clubs; inspectors with a sympathetic attitude towards school agriculture; evening continuation schools for rural boys and girls not attending day school; practical subjects of study in touch with rural life; the present small rural school as opposed to the consolidated school.

On the other hand it was found that nearly all of the points above mentioned which received the approval of the public at some meetings at others met with disapproval. For example, resolutions were passed expressing the disapproval of those present at certain meetings with respect to the following: school gardens, agriculture as a subject of study in elementary schools; consolidated schools, residential high schools; the newer subjects, such as agriculture, manual training and household science. (Reading, writing and arithmetic were considered the only essential subjects.)

The resolutions expressing opposition to the newer movements connected with agriculture, instruction seem to indicate that those responsible for such resolutions feel that the changes will entail considerable expense and many gatherings of rate-payers expressed themselves as satisfied with the present system of rural schools.

In spite of the conflict of opinion exemplified herein, the same having been not altogether unexpected, the Department feels that already the interest in educational affairs, particularly with regard to agricultural instruction, which has been aroused by this campaign will bring forth good fruit in the near future. Those officials interested in agricultural instruction in the schools of Canada will do well to keep in mind that farmers and the rural population generally will look with suspicion and justly so, on anything which seems to limit the education of their children to one particular vocation, whether that be farming or otherwise.

PART IV

Special Contributions, Reports of Agricultural Organizations, Notes and Publications

SEWAGE DISPOSAL IN RURAL DISTRICTS

THE ONTARIO AGRICULTURAL COLLEGE

BY WM. H. DAY, B.A., PROFESSOR OF PHYSICS

THE system which we recommend is the same in general principles as that described by Dr. Bryce in the July number of THE AGRICULTURAL GAZETTE, but there are four points of difference in details.

1. We advise about a foot of earth or more to be spread over the top of the tank permanently so that there will not be any necessity of putting straw over it in the winter. We have known small tanks not in heavy use to freeze up in extreme weather when not properly protected and the straw would sometimes be forgotten till too late.

2. We advise an overflow pipe from tank No. 2. If everything would always work satisfactorily this would be unnecessary, but unfortunately with septic tanks, as with everything else, things sometimes go wrong. We have known roots of trees to penetrate the tile and clog the system, in which case the siphon *must* cease to work and the tanks must overflow. Other causes sometimes produce stoppage. In such cases if there is no overflow pipe provided, the water must ooze out through the cracks at the top and this may not be discovered until the soil above and around the tanks has become sufficiently saturated to show at the surface,—and all this time the mouth of the soil pipe is submerged, causing a tendency for solids to accumulate in the soil pipe itself. With an overflow pipe provided these results are avoided, and any stoppage in the system is discovered at once. For three years the writer has been occupying premises where the septic tank has an overflow pipe as described and in that time no disagreeable odour from it has been detected, except when overflow occurred due to roots clogging the system, on which occasion the overflowed water as well as the odour from

it served the useful purpose of drawing attention to the trouble.

3. As to grade in the tiles we have been advising that all the laterals and that part of the main opposite the laterals should be on the same level, i.e., no fall in any of them, and in that part of the main from the tank to the laterals there should be whatever fall may be available. The reason for the absorption bed being placed all on the same level is that all parts of the system then have their equal share of work to perform. If the laterals are lower at one end than at the other then the low end will have water standing in it after the other end is free of water, and if this difference is great enough there may be danger of the soil at the lower end becoming water-logged and foul.

4. We have not been advising "a tile leading to the surface at the end of a row." In our opinion this does not give as good aeration of the soil as when there is no such tile. When the tank empties the water displaces the air from the tile. If there is no tile leading to the surface, part of that air goes out through every tile joint and is thence forced into the soil pores, displacing the air already in them and driving it to the surface. As the water is absorbed into the soil below the reverse process takes place, i.e., air is drawn from the soil pores into the tile and fresh air from the atmosphere into the pores. With a tile leading to the surface this "breathing" takes place through the tile instead of through the soil. It is possible, however, that the method suggested by Dr. Bryce may, as he suggests, give more complete nitrification of any solids remaining in the tile.

These points are not mentioned as criticisms of Dr. Bryce's system but merely indicating the difference in practice which we advise, and our reasons.

MANITOBA AGRICULTURAL COLLEGE

BY J. B. REYNOLDS, M.A., PRESIDENT

I have read carefully in the July number of THE AGRICULTURAL GAZETTE the article of Dr. Bryce describing a system of sewage disposal for rural and suburban districts. The system recommended corresponds with that taught by the Manitoba Agricultural College. In this province, however, certain safeguards on account of the severe climate are found

necessary. All water pipes above ground, or near the surface, require to be thoroughly insulated. For a filter bed it is recommended for Manitoba that the whole bed be covered in the wintertime with straw or coarse manure. The septic tank, if it is above ground, requires the same protection.

UNIVERSITY OF SASKATCHEWAN

BY A. R. GREIG, PROFESSOR OF AGRICULTURAL ENGINEERING

THE system as outlined by Dr. Bryce of sewage disposal is practically the same as we recommend with one or two exceptions.

In the first place the soil pipe from the house should be turned down so that it delivers the sewage below the surface of the water in tank No. 1. A scum gathers on this water and this scum should not be disturbed. Another point, it has been found that liquefaction is more complete in a deeper tank than outlined by Dr. Bryce. We recommend that this tank should be not less than four feet in depth from the level of the bottom of the delivery pipe from tank No. 1 to tank No. 2.

Tank No. 2 is better made shallower than shown in Dr. Bryce section on page 652. The capacity can be obtained by increas-

ing the area. This overcomes the necessity of having a septic tank close to a bank or grade, so that a seepage pipe may be only 12 inches below the ground.

In larger institutions a switch is put in where the main pipe from Tank No. 2 joins the seepage pipes. This switch is so worked that one portion of the seepage bed is used, say for one week, then the switch is turned over and the other portion is used. Thus one-half gets a chance to dry out properly and aerate during the period of rest.

With these exceptions we find Dr. Bryce's system the same as we have been recommending to the farmers in Saskatchewan. I have no doubt, however, that Dr. Bryce's system has been found to work very satisfactorily.

THE INTERMITTENT DISCHARGE OF FLUIDS FROM SEPTIC TANKS

A correspondent of THE AGRICULTURAL GAZETTE enquires regarding the operation of the siphon in the septic tank described on page 652 of the July issue. The author of the article, Dr. P. H. Bryce, in describing the exact operation of the siphon states that he has experimented during the past thirty years with various means of causing a sudden and intermittent discharge of the tank and has found that the siphon is most practical because of its comparative cheapness, its lasting qualities and its little liability to get out of order. While it is somewhat difficult to make the reader of a description understand readily the operation of a siphon without showing a model of it in operation, yet it may be stated that the one in the diagram on page 652 consists of an outlet in which water in the bend or trap encloses air in the upper tube. This air in the upper end is there again enclosed by the simple inverted cast iron bell, the bottom of which is closed so soon as the sewage in No. 2 tank rises past the open bottom. This is indeed the whole of the siphon. As the sewage rises in tank No. 2 the pressure upon the enclosed air in the bell increases in proportion to its height. As will be apparent the air in the upper leg of the siphon presses the water in the trap grad-

ually past the middle line so that the air begins to bubble up in the short leg leading to the tiles. Of course this air is followed by water in the upper leg of the siphon until a continuous flow of water is ensured, when the tank is rapidly emptied in less than a minute in a small tank. Many who have observed this operation of a siphon have thought that it was a simple operation for anyone to make a good working siphon. If they think so it may be well for them to learn by experience that the action of a siphon is a delicate matter, to ensure the invariable discharge so soon as the water in the tank has risen to a definite height. It will be found that this can only be ensured by some means for establishing after each discharge exactly the same air pressure within the bell of the siphon. This is obtained in the present case in the figure by a small tube reaching down into the bell, the mouth of which is closed as the water rises past it within the bell. It will be apparent that with this the enclosed air will each time after the intermittent discharge have the same atmospheric pressure. For the information of enquirers the author of the article would state that any modern siphon company is likely to supply a good article.

SOCIETIES AND ASSOCIATIONS

THE CANADIAN SEED GROWERS' ASSOCIATION

FIELD ROOT SEED PRODUCTION

BY L. H. NEWMAN, B.S.A., SECRETARY

THE Seed Growers' Association is interested primarily in the production of registered seed of all kinds of farm crops. Registered seed represents the highest class of seed produced. It is defined as seed which originates directly from a pure stock, the identity, quality and general character of which are known. The value of such seed in the case of field roots is particularly striking. Up to the present farmers have not had the assurance they should have regarding the quality, vitality and purity of the root seed they have purchased. As a result the yields and quality have not been as high as they might otherwise have been. Many agencies are at work throughout Canada in encouraging farmers to produce root seed on their own farms, and out of those who have given the matter a trial the Association has enlisted a number who wish to go still further and produce seed which can be recognized officially as "Registered Seed."

This spring a quantity of Elite Stock seed was purchased from Macdonald College at \$1 per pound and sold at cost to 22 farmers scattered here and there through-

out the Dominion. These men have agreed to follow our regulations carefully in order that the seed produced, as well as the succeeding generations, may be given a standing. Stock seed has also been procured from Dr. C. A. Zavitz of the Ontario Agricultural College and placed in the hands of men who will propagate it under Canadian Seed Growers' Association rules. Within two or three years the association hopes to have a goodly number of members offering a considerable quantity of registered field root seed for sale at reasonable prices.

An interesting experiment is being conducted this year in co-operation with the Experimental Farms Branch in comparing home-grown seed with imported seed of the same variety. The Mammoth Long Red variety is being used. The home-grown seed was produced last year at the Experimental Farm, Ottawa, and equal quantities of this and of imported seed have been sent to 48 different farmers in Canada, who have agreed to grow the two side by side and to compare results.

THE HILL SELECTION OF SEED POTATOES

BY L. H. NEWMAN, B.S.A., SECRETARY

DURING the past few years a considerable number of farmers scattered here and there throughout Canada have been practising the hill selection of potatoes under the direction of the C.S.G.A. Their chief aim has been to improve upon the type with which they are working. In the case of the potato, reproduction takes place in a vegetative way by means of tubers which are simply specialized parts of underground stems. While the peculiarities of the mother plant are ordinarily reproduced by means of tubers without any striking deviation, yet variations frequently occur, and it is by taking advantage of this fact and selecting hills which have deviated in an advantageous direction that improvement is obtained. In order to systematize this work and to make it relatively simple for the grower, the association has adopted a certain system of selection. This system requires that a number of specially desirable hills be selected each year and that these be planted by themselves the following year. As a rule each hill must be planted by itself in order that the progeny

may prove the real worth of the mother hill. Under certain circumstances the selected hills may be bulked together and used to sow the following year's seed or nursery plot. Some good results have been obtained by this method, progress having been made in instances in increasing the productiveness of the sort, while in other instances disease resistance is believed to have been intensified.

THE SEED CENTRE SCHEME

Owing to the fact that comparatively few farmers have either the time or the inclination to carry on this special line of work, together with the fact that buyers are usually looking for a uniform lot of potatoes, the seed centre scheme of potato propagation has been introduced. This system permits a number of growers in a district to get together and decide upon one variety and to adopt certain measures by means of which this variety may be multiplied and handled in a large and businesslike way. In order that a uniformly high quality of stock may be grown

from year to year, the centre chooses one of its members to produce what is known as "Elite Stock Seed" for the use of the other members. As this stock seed is usually produced in rather small quantities this grower as a rule multiplies it for one year, and is then able to supply each of his fellow members with a few sacks at a price previously agreed upon. Sometimes, however, the selector may be able to produce enough Elite Stock Seed to supply each of the other members in the Centre with, at least one sack. In this case these members can multiply this sack for one year and thereby obtain sufficient seed to sow their potato-growing land the following year. This is the better practice.

All seed grown in the above manner may, if passed by the inspector who examines both the growing crop and the tubers in the sacks or barrels, be accepted for registration and given a standing as "Registered Seed". No seed, however, can be accepted for registration which is more than three generations removed from Elite Stock Seed. This makes it necessary for the growers either to obtain a sack of stock seed each spring, and multiply it for the following year's use, or to obtain all of their seed from the special selector each year. Obviously the former course is cheaper. There are not many seed-potato growing centres in Canada yet, but it is expected that the number will increase.

THE ONTARIO BEE-KEEPERS' ASSOCIATION

Mr. Morley Pettit, Secretary of the Ontario Bee-keepers' Association, recently mailed a return post-card to each bee-keeper in Ontario of whom he has the address, asking for a report of the honey crop. The return portion asked the following questions:—

How many colonies, spring count?
Total crop of white extracted honey.
Total crop of white comb honey.
Prices received for sales made.

This information was required to be supplied not later than August 5th, and was asked for 1915 and 1916. The reports have been summarized by counties showing where the crop is good and where it is poor. Comparisons have been made with last year's crop and the prices received. Account was also taken of the price of fruit and whatever else might effect the demand for honey. The committee met on August 10th, to consider the reports received. Nearly five hundred bee-keepers from all parts of the province reported their crops to

average about ninety pounds per colony. The quality of the honey is excellent, light in colour, heavy body and a good flavour. Although the crop is large, the committee thought it should find ready sale at the prices recommended last year. Members of the association are advised to sell as much as possible at home at retail prices, and distribute the selling over the year, remembering that if the dry weather continues there may be no crop in 1917, and that honey may profitably be held over. The prices recommended are as follows:

No. 1 Light Extracted, wholesale 10c. to 11c. per lb.

No. 1 Light Extracted, retail 12½c. to 15c. per lb.

No. 1 Comb, wholesale \$2.00 to \$2.75 per dozen.

No. 2 Comb, wholesale \$1.50 to \$2.00 per dozen.

These prices are f.o.b. in 60 lb., 10 lb. and 5 lb. tins. The average number of pounds per colony is 89.6.

HOLSTEIN-FRIESIAN MILK RECORDS

The Secretary of the Canadian Holstein-Friesian Association reports that from June 1st to July 15th the records of sixty-nine cows and heifers were received and accepted for entry in the Record of Merit. Of these cows May Echo Sylvia, 11,385, owned by A. C. Hardy, Brockville, Ont., completed several world's records, the records being as follows:

	Milk	Fat
1 day.	152 1 lb.	
7 days.	1005 8 "	41. lb.
30 "	4196.9 "	169.72 "

60 "	8220 1 "	323 32 "
90 "	11855 1 "	463 67 "
100 "	12899 8 "	505 34 "

Pontiac Belle of Manor, 24,977, owned by the Dominion Experimental Farms, headed the junior three-year-old class with the following record:

	Milk	Fat
7 days.	419 lb.	21 24 lb.
14 "	876 "	41 09 "
30 "	1956.5 "	85 34 "

THE CANADIAN AYRSHIRE BREEDERS' ASSOCIATION

Mr. W. F. Stephen, Secretary of the Canadian Ayrshire Breeders' Association, has issued a pamphlet containing the official Canadian records of Ayrshire cows under the Record of Performance, revised up to May 1st, 1916.

The pamphlet contains the records of 770 cows and heifers that gave an average production, within one milking period, of 8,682 pounds milk, containing an average of 354.8 pounds fat. The following are the average records by ages:

	Milk	Fat
	lb.	lb.
224 Mature Cows	10,254	413.90
74 Four Year Olds	9,358	380.77
154 Three Year Olds	8,447	346.71
318 Two Year Olds	7,532	311.19

The pamphlet also contains the standard for registration in the Canadian Record of Performance, photo engravings of a number of the highest producing cows and the scale of points for the Ayrshire cow and the Ayrshire bull.

THE WESTERN CANADA IRRIGATION ASSOCIATION

At the tenth annual convention of the Western Canada Irrigation Association held at Kamloops, B.C., July 25th, 26th, and 27th, there was an attendance of about 150, including a good delegation from the Prairie Provinces. A feature of importance was the announcement made by Mr. F. H. Auld, Deputy Minister of Agriculture, Saskatchewan, that his Department recognized the importance of irrigation and of the work being carried on by the association to the extent that they now feel justified in giving material financial assistance. The association has in the past been able to carry on its work largely because of the financial assistance given by the Dominion Government and by the provinces of Alberta and British Columbia. The fact that Saskatchewan now enters the list of contributing governments indicates the widening scope of the association's work and the steadily increasing importance attached to irrigation as a branch of agriculture. This is further emphasized by the fact that Maple Creek in the province of Saskatchewan was chosen as the place of meeting of the next convention.

His Royal Highness the Governor-General was in Kamloops on the last day of the convention and being invited to become a patron of the association, graciously consented.

ELECTION OF OFFICERS

The following officers were chosen:—

Honorary President, Hon. W. J. Roche, Minister of the Interior, Ottawa, Ontario; President, Hon. W. R. Motherwell, Min-

ister of Agriculture, Regina, Saskatchewan; 1st honorary vice-president, Hon. Duncan Marshall, Minister of Agriculture, Edmonton; 2nd honorary vice-president, Hon. W. R. Ross, Minister of Lands, Victoria, B.C.; 1st vice-president, Senator H. Bostock, Ducks, B.C.; 2nd vice-president, G. R. Marnoch, president, Board of Trade, Lethbridge, Alta.; Executive Committee, F. H. Peters, Commissioner of Irrigation, Calgary, Alta., chairman; R. G. Williamson, Maple Creek, Sask.; W. D. Trego, Gleichen, Alta.; A. S. Dawson, Chief Engineer, Dept. of Natural Resources C.P.R., Calgary, Alta.; W. E. Scott, Deputy Minister of Agriculture, Victoria, B.C.; Jas. L. Brown, Kamloops, B.C.; Jas. Johnstone, Nelson, B.C.; F. E. R. Wollaston, Vernon, B.C.

Mr. Norman S. Rankin, who has been permanent secretary of the association for several years, tendered his resignation on account of enlistment for active service overseas. The executive declined to accept his resignation, but granted him leave of absence and appointed Robert J. C. Stead acting secretary during his absence.

RESOLUTIONS ADOPTED

Resolutions were adopted, after a series of most interesting addresses that were closely followed, looking to a continuation of the surveys south and east of Lethbridge, so that the land may be adapted through irrigation to the furtherance of the live stock industry, and urging the British Columbia government to increase its encouragement to irrigation.

THE ENTOMOLOGICAL SOCIETY OF ONTARIO

The 53rd annual meeting of the Entomological Society of Ontario will be held at the Ontario Agricultural College, Guelph, on November 2nd, 3rd, 1916.

The secretary of the association is A. W. Baker, Ontario Agricultural College, Guelph.

NEW PUBLICATIONS

THE DOMINION DEPARTMENT OF
AGRICULTURETHE DOMINION EXPERIMENTAL
FARMS

Exhibition Circulars—A series of Exhibition Circulars has been issued by the Dominion Experimental Farms. Circular number 52 deals with the "Care of Farm Machinery", and is by W. L. Graham, B.S.A. It gives advice as to housing and care of implements before housing, along with diagrams of the sheds required.

Circular number 55 deals with "The Stockman's Duty to Conserve Manure", and is by E. S. Archibald, Dominion Animal Husbandman. This affords advice on the keeping and use of farm manures, describing how they should be handled, preserved and applied.

Circular number 57 is on "Pitting Roots", by F. S. Brown, B.S.A., Assistant to the Dominion Agrostologist. The pitting of roots on sandy or sloping land is especially dealt with, but some advice is also given regarding pitting on level land or heavy clay. It should be mentioned that the majority of the Circulars are aptly illustrated.

Circular number 64 is on "Crop Production", and is by J. H. Grisdale, B.Agr., Director of Experimental Farms. Mr. Grisdale describes the relative value of moisture and warmth. He also has something to say about plant food, concluding with a brief treatise on agricultural operations and implements.

Circular number 70 on "Crate Feeding" is by F. C. Elford, Dominion Poultry Husbandman. Mr. Elford after saying that no poultry intended for eating should be marketed without being fleshed, and that the easiest way to do this is by crate feeding, proceeds to tell how to make a crate; of the most suitable birds, a strong constitution being essential; treatment for lice; the best methods of feeding; how rations should be mixed; ending with some notes on cooling and packing.

THE DIVISION OF BOTANY

The Black Leg Disease of Potatoes, caused by *Bacillus solanisaprus*, Harrison, by Paul A. Murphy, B.A., A.R.C. Sc.I., Assistant in charge of Plant Pathological Field Station for P.E.I.; Circular No. 11. The Dominion Botanist in his letter of introduction bears testimony to the fact that owing to the efforts that have been made by the plant pathologists, Black Leg in potatoes has decreased, but that it still causes destruction, especially in the Maritime Provinces. It is, therefore, par-

ticularly for that section of the country that this eight-page bulletin has been prepared. It describes the symptoms, gives the life history of the causal organism, refers to the amount of loss occasioned and details methods of control, concluding with notes on the preparation and use of the disinfectants suggested. It is announced that further information desired can be obtained by applying to the Dominion Botanist at the Central Experimental Farm.

THE DIVISION OF APICULTURE

Bees and How to Keep Them, by F. W. L. Sladen, Dominion Apiarist; Bulletin No. 26, second series. In the sixty pages comprising this bulletin the Dominion Apiarist has gone fully into his subject. In a seven-line introduction, he says that his purpose is three-fold, first, to point out the advantages of bee-keeping, secondly, to give in brief form reliable advice to the beginner, and, thirdly, to show to those who are keeping bees in an old-fashioned or neglectful way how their profits may be doubled or trebled by the adoption of modern methods. Bees, Mr. Sladen suggests, are more often neglected than other kinds of live stock, being hidden in their hives and seldom showing that they need attention. Having disposed of the advantages offered by bee-keeping, the author goes on to describe the requirements of the occupation. He tells how to get the best results, the methods that should be employed and the care and attention that are necessary at different periods. He gives a list, with illustrations in every case, of the principal honey-producing plants with their approximate seasons of yield; he deals with swarming and swarm control; he tells when and how colonies should be divided, describes methods of transferring, uniting, re-queening and feeding, and finally treats of the diseases and enemies of the bees.

THE DIVISION OF CHEMISTRY

Soil Fertility; Its Economic Maintenance and Increase, by Frank T. Shutt, M.A., D.Sc., Dominion Chemist; Bulletin No. 27, second series. This is an address to farmers' institute workers in which Dr. Shutt points out what must be done in order to get more out of the soil. He also seeks to aid in the campaign for increased production. "We have been terribly wasteful of plant food" says the doctor, who adds "especially in the Northwest, where farming has been likened to mining, and it is by sounding a note of warning for the future that we should endeavour to get our farmers to maintain and increase the fertility of our soils, and by better, more

rational methods, to put a stop to that waste." Although emphasis is placed upon the need for more economy of the soil in the Western Provinces, Dr. Shutt does not fail to add "This warning is necessary in Ontario and Eastern Canada." Thus the bulletin becomes of importance to the entire country. It deals explicitly with the properties of farm-yard manures, their value and their application. All the information conveyed has been gathered from actual experiments, the results and conclusions derived from which are described in some detail. Important statements are that where the manure is not at once utilized by being put into the soil, or on to the soil, the farmer is losing one-third the initial value of that manure and that the losses of the virtue of the manure are least where it is kept compact and protected from rain. A table is given showing the approximate average composition of manure (fresh) from various animals. The manurial value of clover is set forth and notes supplied on the value and function of various fertilizers. The domestic sources of potash, other than manure, are dealt with and an analysis of seaweeds on the Atlantic seaboard given. In conclusion the doctor urges farmers to take advantage of the different means and agencies provided by the governments, Federal and Provincial, by information, advice and demonstration, for their assistance in greater and better productivity.

THE PROVINCIAL DEPARTMENTS OF AGRICULTURE NOVA SCOTIA

Report of the Secretary for Agriculture, 1915. Comprising upwards of 450 pages, the Report of Professor M. Cumming, Nova Scotia's Secretary for Agriculture, is a comprehensive one. It embraces the Secretary's own reports, first as a provincial officer, and then as Principal of the Provincial Agricultural College at Truro, the reports of the Professor of Botany, of the Provincial Entomologist and the Professor of Zoology, of the Professor of Horticulture, of the Superintendent of the College Farm, of the Poultry Department, of Dairying and Women's Institutes, of the Chemist and of provincial agricultural societies, associations, exhibitions, field crop competitions and meetings, the whole concluding with a series of articles on soils and the crops of the province, covering 206 pages.

NEW BRUNSWICK

The Rural Science School Bulletin, No. 1 of this publication, which is issued under the auspices of the Woodstock and Sussex schools of rural science, comprises 60 pages, with cover, of good clear type on

superior paper. Its contents are varied, treating of pretty well every branch of its subject matter. Work for intending graduates is outlined, entomology is dealt with, chemistry on the farm receives attention, as do school gardening, domestic science, improvement of school grounds, the economic value of birds and kindred subjects. Particulars of the work of the school are given along with lists of the students.

QUEBEC

Breeding and Preparing Hogs for Market. After briefly sketching the rise of Canada's export trade this 24-page plentifully illustrated Bulletin, No. 18, proceeds to give such details as are calculated to encourage the industry in the province of Quebec. An introductory note sets forth that it is the first of a series to be issued with the same object in view. The provincial Minister of Agriculture is impressed with the possibilities of hog production in Quebec and is assured that there is a fine return awaiting the farmer who will raise hogs on correct principles. Much attention is paid to the requirements of the packing houses and to the methods they employ. The farmer is told that while his local market may be limited for dressed pork the market for live hogs is unlimited all the year round.

Crop Bulletin for the Province. The July Bulletin on the appearance of the crops in the province of Quebec sets forth that the greater part of the present season has been characterized by low temperature, much rain and a lack of sunshine. The work of preparing the soil and sowing was performed under great difficulties in most counties of the province. Many farmers were unable to sow the area they intended in oats or wheat. Several had recourse to buckwheat and barley, but there was still a shortage in the area sown. Some fall-ploughed land remained unsown. Exception, however, had to be made of the Lake St. John and lower St. Lawrence regions, where seeding was done in time, and where all crops promise a full yield. The bulletin gives details of the situation by districts, noticeable features being the promising appearance of the apple trees and the excellent prospects of clover and timothy and pasture land generally. The general average of all crops for the province was given as 78 per cent.

ONTARIO

Shepherd's Hand-book. This little book of a size convenient for carrying in the breast pocket and issued by the Canadian Sheep Breeders' Association (R. W. Wade, Secretary, Toronto), contains in its 24 pages, a list of the officers and directors for

1916, the scale of points in judging for practically every breed of registered sheep and a comprehensive breeding table.

The Dairy Standards Act, passed at the last session of the legislature, has been printed, along with the provincial Minister of Agriculture's explanation in introducing the measure, and a report of the discussion that took place in committee, in bulletin form for general circulation. Details of the Act, which does not come into force until March 31st, 1917, were given in the June number of THE AGRICULTURAL GAZETTE, Vol. 3, page 552.

MANITOBA

Standing Crop Competitions and Seed Fairs, by T. J. Harrison, B.S.A., Professor of Field Husbandry. In this 12-page bulletin directions are given to agricultural societies in the arrangement of competitions and the drafting of prize lists, to competitions respecting selection of seed and preparation of the land, and to judges relative to methods of standardizing the different classes of grain entered for competition.

ALBERTA

The Production of Timothy Seed. by H. A. Craig, Deputy Minister of Agriculture. With a view to meet the Eastern Canadian demand for timothy seed the Alberta Department of Agriculture have been carrying on investigations as to the capability of the province. This booklet of eight pages describes the results. It says that during 1915 sufficient Alberta-grown seed was marketed to test the requirements of the trade and to establish the standing of Alberta seed in Eastern markets. After stating that six or eight cars of Alberta seed found their way east in the early months of the year, and that reports emphasize the superiority of the seed over that of the United States, the bulletin points out that Canada requires six or seven hundred thousand bushels of timothy seed annually, sixty or seventy per cent of which has been coming from across the border, and concludes that "On account of the adaptability of our soil to timothy growing over a considerable area, and of the superiority of the Alberta-grown seed, it would appear to be sound economy for Alberta farmers who have the right kind of land to give some attention in the future to the production of this crop for the Canadian market." There is equal opportunity for securing a good market in the United States, Mr. Craig thinks, and by way of encouragement he points out that wholesale prices have risen in the last ten years on the Chicago market from \$4.50 to \$7.00 per cwt. The bulletin goes on to describe soil adaptations and cultural

methods, concluding with references to shipping and marketing.

BRITISH COLUMBIA

Butter-making on the Farm, by T. A. F. Wiancko, Provincial Dairy Instructor. Clear and concise information and instruction, with illustrations, are given in this Bulletin, No. 71, of the Live Stock Branch of the Provincial Department of Agriculture, on the management of the dairy and the method in which to turn out the highest grade of butter.

MISCELLANEOUS

Holstein-Friesian Herd Book, Volume XIX, Part I of this recently issued volume, contains the record of bulls from No. 21841 to 25625 and Part II of cows from 32521 to 39000, representing 3785 bulls and 6480 cows. Part III comprises a complete index of all the registrations contained in the volume. A list of the officers for 1916, also of members, along with the constitution and by-laws and minutes of the 33rd annual meeting held in Toronto, February 2nd and 3rd last, precede the records.

Rural Denmark and Its Schools, by Harold W. Foght, Specialist in Rural School Practice, National Bureau of Education of the United States, author of "The American Rural School": New York, the Macmillan Company, 5 by 7½ inches; 355 pages.

A story of the wonderful uplift in agriculture that has taken place in Denmark, such as this book contains, possesses not alone interest for everybody concerned in the welfare of countries, but lessons of vast practical importance for all peoples of the earth. "Denmark," says Mr. Foght, "found itself in dire distress, both of a political and a social-economic nature. The discredited country sought the panacea for its ills in a remarkable school system which furnishes a broad culture and thorough technical preparation to every man, woman and child living in its rural districts. The results have been marvellous. A war-crippled and almost bankrupt nation has, within two generations, taken an honourable place among the producing nations of Europe." The loss of Schleswig-Holstein, while a serious blow, instead of discouraging Denmark prompted the nation to further effort, and it was after that event that the great renaissance commenced. The area of Denmark is less than one-twenty-seventh of Ontario and its population some 200,000 more than that of this province. Quebec in area, with Ungava included, is forty-seven times larger than Denmark. Manitoba, Alberta and Saskatchewan are each 16 times as large and British Columbia is 24 times. Nova Scotia is the nearest of the provinces in

size, and, with 6,000 more square miles, it possesses barely a sixth of the population. These comparisons will convey an idea at once of the immensity of Denmark's achievement in becoming one of the foremost agricultural countries—from an industrial and in a proportional sense—in the world and of the possibilities before Canada. The work under notice shows how this wonderful development has taken place. It is divided into two parts, the first under the heading of "The Recent Danish Agricultural Rehabilitation"—telling of rural progress in recent years, of the struggle in the development of the land,

of the importance of co-operation in the Danish agricultural system and of the social life of rural Denmark. The second part deals with the work of the rural schools in the national reorganization under three headings: The Elementary Rural Schools, The Agricultural Schools and the Folk High Schools. An appendix gives a brief statement of the rural life movement in the United States, for, while the book is of wider-spread interest, it was primarily written for digestion in that country. A series of illustrations of scenes and buildings in Denmark increase the value and attractiveness of the work.

NOTES

Mr. Theodore Ross, B.A. has resigned from the office of Secretary for Agriculture for the province of Prince Edward Island.

In an automobile census carried out in the counties of Lennox and Addington by Mr. C. B. Curran, B.S.A., District Representative, it was shown that of the 285 automobiles owned, 209 or 73½ per cent were possessed by farmers.

Mr. J. G. Britton, B.S.A., Demonstrator in Vegetable Gardening at the Ontario Agricultural College, has accepted a position with the Department of Education of British Columbia as District Supervisor of Agricultural Education.

The Honourable Jas. S. Duff, Minister of Agriculture in Ontario, has issued a circular urging the farmers of the province to treat all fall wheat seed for smut. The formalin treatment, the one usually adopted, is fully described.

A Bureau of Social Research has been jointly organized by the governments of Manitoba, Saskatchewan and Alberta, the object being to make investigations of social welfare matters. The controlling agencies will be a council in each province consisting of a cabinet minister and five appointees. Two members of each of these councils will be selected to serve on an interprovincial council. Inquiries have been sent to secretaries of Women's Institutes, Homemakers' Clubs, Farmers' Institutes and other agricultural organizations, as well as to school teachers and ministers, relative to the social conditions in their different districts.

Forty car-loads of flour, the gift of the grain growers of Saskatchewan to the British empire, left Moose Jaw early in August. The flour was put up in 40,000 bags of 80 lb. each. Another shipment was to follow.

The Department of Natural Resources of the Canadian Pacific Railway Company have issued a hand book describing the irrigation enterprises of the country in the neighbourhood of Calgary. The hand book contains a considerable amount of information on the subject of irrigation and agriculture.

The stallion enrolment law that has just gone into force in the state of New York requires that all stallions before being used for service shall possess a certificate of soundness, breeding and identification, signed by an authorized veterinary surgeon, and verified by the Commissioner of Agriculture of the State.

A contest in weed knowledge is being held by the Boys' and Girls' Clubs in the province of Manitoba. It involves the identification of weeds named in the Provincial Weeds Act, the mounting and naming of weed specimens, and in the writing of essays on weed destruction. A copy of the Act is being sent to rural schools in the province.

The Grain weevil (*Calandria granaria*) has been reported from a few points in the province of Manitoba. Professor J. A. Neilson, Entomologist at the Agricultural College has issued a statement covering briefly the life history of the weevil and means for its control which is stated to be best effected by the fumigation of the threshed grain with carbon bisulphide.

The secretary of the United Farmers of Alberta states that of the 12,000 paid-up members, 2,000, or 16 per cent, have enlisted. Ten per cent of the district secretaries have also gone. The central office of the organization has also contributed more than \$10,000 to the Red Cross fund. This does not include contributions made direct by members and unions to the different patriotic funds.

A Massachusetts district leader has organized several community garden clubs for boys who are unable to secure land for themselves. He arranges for the use of from half an acre to an acre of land, that each boy may have at least one-twentieth of an acre to cultivate. This community plan makes it possible for many to do club work who otherwise would not secure the benefit of this activity.

Mr. Frank Palmer, B.S.A., has been appointed to succeed Mr. F. M. Clement as Director of the Horticultural Experiment Station at Vineland, Ontario. Mr. Palmer, who is the son of a well known fruit grower in British Columbia, graduated from the Ontario Agricultural College in 1913, and since his graduation has been attached to the Fruit Branch of the Ontario Department of Agriculture at Toronto.

One Missouri farmer who is co-operating with the State Agricultural College in keeping farm records has decided that he can afford to pay his son 25 per cent of the net profits from the farm for his work. The young man has worked under this plan for about four years and has never failed to clear as much or more than hired hand's wages, besides getting his living, the use of a team and buggy, and having the privilege of profitable employment near home.

In more than 112 districts of Washington where a teacher's cottage is provided, it has been found that much better trained and more efficient teachers can be secured at the usual salary, and that these teachers will usually remain in the community long enough to discover its needs, help it to realize its possibilities, and in every way become valuable factors in the life of the neighbourhood. We believe the teacher's cottage the best way to secure better teachers; better teachers, the best way to create community centres; community centres the best way to revive rural life with far reaching economic effects in making possible rural organization. *Superintendent of Public Instruction, Washington, In the Banker Farmer.*

At a joint meeting of the Saskatchewan sheep and swine breeders' associations it was decided to hold the annual sales of pure-bred stock at Regina on October 25th and at Saskatoon a week later. The Department of Agriculture, at the time of these sales, purchases a number of grade range ewes to distribute to farmers wishing to start with a small flock and to be supplied with the same on credit terms under the Live Stock Sale Regulations.

The Ontario Demonstration Farm at Monteith, although situated in the immediate vicinity of the destructive fire that swept a large section of New Ontario, escaped untouched. In the same conflagration, however, the property of the Dominion Government was not so fortunate. The Clydesdale stallion Baron Richardson 2nd No. 11561, placed by the Live Stock Commissioner with the Matheson Live Stock Improvement Association, was lost in the flames, being stabled at Matheson at the time.

A county superintendent of schools in Illinois has five country-life directors employed on full time for the supervision of boys' and girls' club work. In sections where it is impossible for boys and girls to secure pieces of land suitable for the garden work, the country-life director is authorized to rent a few acres of ground and sublet it in plots of one-twentieth of an acre up to members of the garden club. This plan is different from the ordinary school garden in that every child has a piece of ground of a size to permit a net profit on investment.

The Edmonton Horticultural Society on July 27, awarded the prizes in the society's gardens competitions. There were close upon a hundred entries in the different classes, of which there were five competing in flower gardens, vegetable gardens and lawns. Prizes were also given for collections of flowering shrubs and plants. There were 12 entries in a vacant lot competition, for which the awards were \$15, \$10 and \$5. The judging was conducted on the following scale of points: Flower gardens—layout 25, cleanliness 15, discretionary 15; vegetable gardens—vegetables (variety and quality) 60 points, cleanliness 20, layout 20. The lawns were judged on a basis of 20 points, and the displays also on a similar basis. In judging the vacant lots 40 points were taken as the maximum number to be obtained.

INDEX TO PERIODICAL LITERATURE

- The Agricultural Journal*, Victoria, B.C., July, 1916.
Underdrainage Advances Seeding-time Two to Four Weeks, S. H. Hopkins, Assistant Live Stock Commissioner, page 65.
The Strawberry root Weevil on the Saanich Peninsula, R. C. Treherne, Field Officer, Entomological Branch, Dominion Department of Agriculture, page 69.
- August—Fundamentals of Agriculture to be Taught in the Schools, J. W. Gibson, Director Elementary Agricultural Education, page 86.
How the "Egg Marks Act" affects British Columbia Poultrymen, J. R. Terry, Chief Poultry Instructor, page 89.
Where Has the Seed Used in This Province Been Produced. Department to Assist Farmers to Determine Suitability of Seed Production Industry in their Districts, H. O. English, Soil and Crop Instructor, page 91.
- Canadian Farm*, Toronto, July 21st, 1916.
Movements for Rural Betterment—Agricultural Credits Plan, Geo. Batho, page 2.
- The Charlottetown Guardian*, Charlottetown, P.E.I., August 9th, 1916.
A Great Boon to P.E. Island Farmers—Valuable Fertilizer Lying Unused for Centuries in Island Bays and Rivers Now Places at Disposal of Farmers at Nominal Cost by Well Considered Action of Provincial Government, page 4.
- Canadian Poultry Journal*, Hamilton, Ont., August, 1916.
Fred C. Elford, Dominion Poultry Husbandman, and His Work, the Editor, page 356.
- The Canadian Countryman*, Toronto, July 22nd, 1916.
What is Ahead of Ontario's Fruit Industry? Harold S. Fry, B.S.A., page 955.
- July 29th—Solving the Ontario Fruit Growers' Problems, Justus Miller, page 983.
Guaranteeing a Winter Supply of Eggs, George Robertson, page 986.
- August 19th—Where and How to Sell Your Apples, C. W. Baxter, Dominion Fruit Branch, page 1067.
Churning on the Farm in Hot Weather Professor H. H. Dean, page 1069.
- Farmer's Advocate and Home Journal*, Winnipeg, Man., July 19th, 1916.
Winter Rye—John Bracken, Professor of Field Husbandry, University of Saskatchewan, page 1059.
- July 26th—Birds and Their Uses to Man—The English Sparrow—James W. Mercer, K. N., Western Secretary, Canadian Independent Naturalists, page 1087.
- August 2nd—Co-operation in Operation, John G. Rayner, B.S.A., District Representative, North Battleford, page 1111.
- Farm and Ranch Review*, Calgary, July 5th, 1916.
Curing Alfalfa Hay, Field Editor, page 522.
- July 20th—The Country Church—The Minister as a Rural Leader—Garland A. Bricker, Professor of Agricultural Teaching, Syracuse University, page 572.
- The Saturday Press and Prairie Farm*, Saskatoon, Sask., July 29th, 1916.
Why Prairies Demand More Sheep, Professor Tisdale of the University of Saskatchewan, page 4.
Building Plans for Farms, College of Agriculture Staff, co-operating with the British Columbia Government, page 14.
- August 19th—Ocean Freight Rates in 1915, W. Sanford Evans, Chairman Georgian Bay Commission, page 3.
Live Stock in Saskatchewan, Hon. W. R. Motherwell, Minister of Agriculture, page 7.
- Prairie Farm & Home*, Regina, July 19th, 1916.
Turkey Culture, George Robertson, Central Experimental Farm, page 6.

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October, 1916

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DEPARTMENT OF AGRICULTURE

The Agricultural Gazette of Canada

EDITOR · J. B. SPENCER, B.S.A.

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CONTENTS

	PAGE
Training for Agricultural Instruction.....	855

PART I

THE DOMINION DEPARTMENT OF AGRICULTURE

The Entomological Branch:—	
The Control of Insect Pests in the Orchards on the Indian Reserves in British Columbia, by Tom Wilson.....	856
The Dominion Experimental Farms:—	
Exhibit at the Central Canada Exhibition, by J. H. Grisdale ..	860
The Division of Botany:—	
The Grain Rust in the Prairie Provinces.....	861
The Seed Branch:—	
Timothy Seed Shipments by George H. Clark.	864
The Dairy and Cold Storage Branch:—	
Precooling Raspberries, by Edwin Smith..	865
The Live Stock Branch:—	
The Egg Situation, by J. H. Hare.....	867
Preliminary Report of Wool Grading Operations, 1916, by T. Reg. Arkell...	868

PART II

THE PROVINCIAL DEPARTMENTS OF AGRICULTURE

Agriculture in Canada:—	
Manitoba, by George Batho.....	870
Co-operative Marketing of Wool:—	
Prince Edward Island, by W. R. Reek..	880
Nova Scotia, by M. Cumming..	881
Quebec.....	881
Saskatchewan.....	884
Alberta.....	884
Prince Edward Island:—	
Women's Institute Convention ..	885
Quebec:—	
Agricultural School Museums, by Jean-Charles Magnan ..	886
The Bacon Industry, by E. Belanger.....	887
The Teaching of Agriculture at Fairs and Exhibitions, by H. Nagant.....	890
The Production of Root Seed, by F. N. Savoie.....	892
The Annex to the Oka Agricultural Institute, by Brother Jean de la Croix.....	893
Root Seed Production at Macdonald College, by P. A. Boving.....	894
Ontario:—	
An Agricultural School for Eastern Ontario, by W. Bert Roadhouse.....	899
An Experiment in Orchardng.....	900
The Hill Selection of Seed Potatoes.....	901
District Representatives' Conference.....	903
Education in Agriculture at Toronto Exhibition.....	905

Saskatchewan:—	PAGE
Co-operative Poultry Marketing Stations.....	907
Potato Selection Work at Saskatoon, by John Bracken.....	907
The Better Farming Train, by A. M. Shaw... ..	909
British Columbia:—	
Cow-Testing Work, by T. A. F. Wiancko	913

PART III

RURAL SCIENCE

The Training of Teachers for Agricultural Instruction:—	
Prince Edward Island, by W. R. Reek.....	916
Nova Scotia, supplied by A. H. MacKay	917
New Brunswick, by R. P. Steeves.	919
Ontario, by J. B. Dandeno	920
Manitoba, by Robert Fletcher	921
Saskatchewan, by A. W. Cocks	922
Alberta, by D. S. Mackenzie.	922
British Columbia, by J. W. Gibson	923
Summer Schools for Teachers:—	
Prince Edward Island, by Professor S. B. McCready	925
New Brunswick, by R. P. Steeves	927
Ontario, by J. B. Dandeno.	929
Saskatchewan, by A. W. Cocks	932
Conference for Rural Leadership at Edmonton...	932

PART IV

SPECIAL CONTRIBUTIONS, REPORTS OF AGRICULTURAL ORGANIZATIONS, NOTES AND PUBLICATIONS

Societies and Associations:—	
The Quebec Pomological and Fruit Growing Society	933
The Dairymen's Association of Eastern Ontario.. . . .	933
The Saskatchewan Live Stock Convention	934
The Alberta Live Stock Association	934
New Publications	934
Notes.	937
Index to Periodical Literature.....	938

The Agricultural Gazette

OF CANADA

VOL. III

OCTOBER, 1916

No. 10

THE AGRICULTURAL GAZETTE of Canada is published monthly, in English and in French, by the Dominion Department of Agriculture. It is not intended for general circulation. A limited number of copies, however, are available to subscribers at \$1.00 per annum, or 10 cents per copy.

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TRAINING FOR AGRICULTURAL INSTRUCTION

IN the September GAZETTE attention was directed to the assistance afforded by THE AGRICULTURAL INSTRUCTION ACT towards the teaching of agriculture in the public school. The point was made that successful teaching demands well informed instructors. In order to arrive at an intelligent knowledge of the opportunities afforded the Canadian teacher for giving instruction in agriculture there have been brought together in this number accounts of what the Normal and Model Schools in the various provinces provide.

In all advanced instructional and investigational work the lack of qualified leaders is acknowledged. The situation in every province is expressed, especially for Saskatchewan, in the language of the Director of School Agriculture for that province, who says: "The demand for well-qualified instructors in agriculture is gradually being felt in this province, and we hope that the university will in time be able to provide these teachers for our high schools and collegiate institutes."

The universities through the Agricultural Colleges afford the opportunity of the time. More especially does the teacher of teachers require the best possible training. Not until the Normal Schools, and Model Schools are in a position to give thorough instruction in agriculture can they hope to graduate teachers inspired and informed for successfully imparting rural science knowledge.

Next in importance to the qualified teacher is the equipment. To the necessary school garden must be added a suitable laboratory in which experiments by the pupils may be carried on. Even before the text book is used the pupil should discover by experiment the lesson set by the teacher. True such experiments are not agriculture, but they open the way for understanding agricultural principles, after which the text book and the lecture will be better understood. The teacher who can thus direct his class must himself be a master of the science of agriculture and if he also knows practical farming the more valuable should be his services to the school and to the community.

THE AGRICULTURAL INSTRUCTION ACT is based on the principle that perseverance in education is necessary to establish perfection in the industry of agriculture. It goes farther, it acknowledges the need of adequate working tools for the imparting of information. The possibilities of this combination established generally are incalculable.

PART I

Dominion Department of Agriculture

INFORMATION SUPPLIED BY OFFICIALS OF THE VARIOUS
BRANCHES REPRESENTED

THE ENTOMOLOGICAL BRANCH

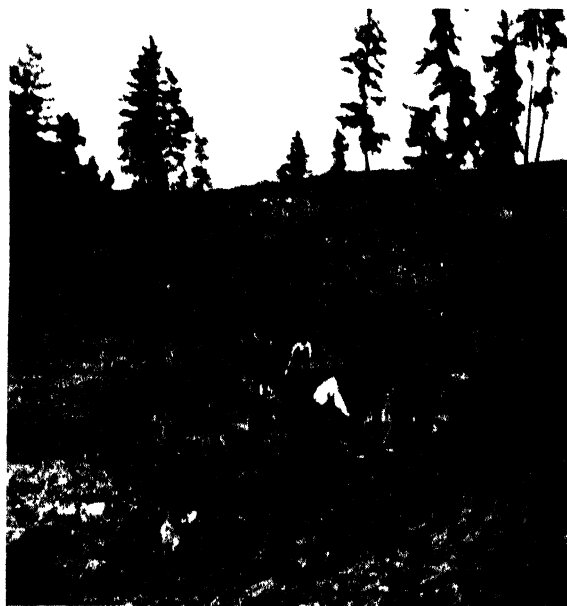
THE CONTROL OF INSECT PESTS IN THE ORCHARDS ON THE INDIAN RESERVES IN BRITISH COLUMBIA

BY TOM WILSON, INSPECTOR OF INDIAN ORCHARDS, ENTOMOLOGICAL BRANCH, DEPARTMENT
OF AGRICULTURE, OTTAWA

BEFORE the white people came to the province the Indians did no cultivation, depending for their fruit on the wild berries that grew plentifully everywhere. They have always been eaters of fruit in one form or another. The wild fruits might be eaten fresh from the bush or tree, or dried, as was the custom in

most highly prized of all the native fruits was the June Berry or Saskatoon, *Amelanchier cusickii* or *A. florida*, but Black Caps, *Rubus leucodermis*, Choke Cherries, *Prunus demissa*, Salal Berries, *Gaultheria shallon*, Soap-oalalie, *Shepherdia canadensis*, and many others were all gathered and stored for winter use.

With the advent of the Christian missionaries came the first orchards. Wherever a mission was established there would be an attempt to make a garden, and fruit trees would be planted with varying success. Where plum stones and apple seeds fell to the ground plum and apple seedlings usually sprang up. The Lower Fraser Valley is extremely conducive to the raising of plums and other stone fruit seedlings, which grow rapidly, and bear fruit in abundance. When the Indians paid their visits to the missions at the times of the different church festivals they very often took a number of these seedlings home to their reserves, where they were planted after a fashion, usually a few feet apart



INDIANS' BREAKING NEW LAND ON THE SPILLAMACHEEN
RESERVE

the more arid parts of the province; or they were beaten to a pulp, partially fermented and mixed with a quantity of fish or bear's grease, as was the custom in the moist part of the country near the coast. The

among the stumps where the land had been roughly cleared. This was the origin of the Indian orchards in British Columbia.

As the plums and cherries came into bearing and many of the pits

fell to the ground they germinated, and new seedlings came up in the already too closely planted space. As a result there was very soon an impenetrable thicket, and when rasp-

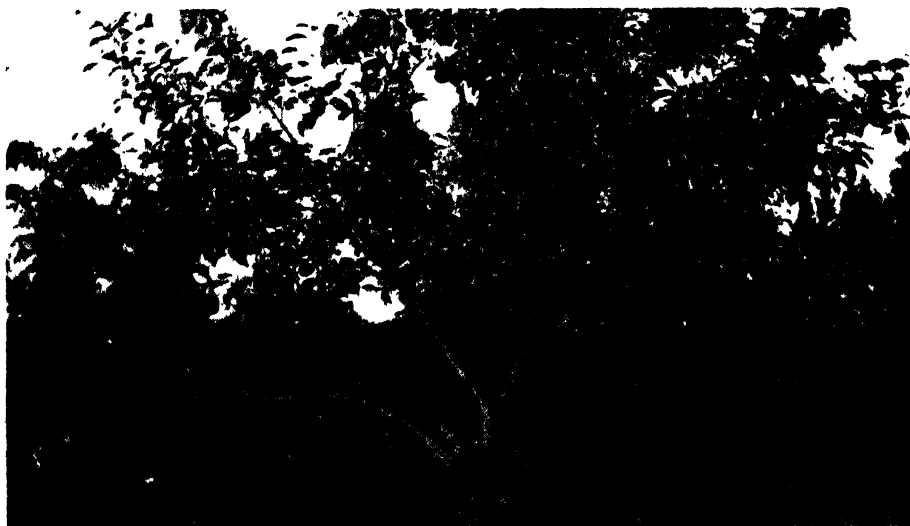
the weaker, we have counted 50 trees on an eighth part of an acre, or enough to plant four times that area. The same thing may be said of other fruits. Many of the trees



COMBINING ONION GROWING WITH ORCHARDING

berry bushes, currant bushes and other small fruits happened to be planted among the trees, the effect may be imagined. Even after the stronger trees had got the better of

have been growing for thirty or forty years or more, and have reached large proportions. In the damp climate of the Fraser Valley these were covered with moss and lichen,



IN AN INDIAN ORCHARD

and in many cases insect pests of various kinds were prevalent. These pests were not by any means confined to the Indians' trees, but were also common in the orchards belonging to white settlers. Nevertheless, the general air of neglect gave a bad appearance, and gave rise to the claim that the Indian orchards were breeding places for orchard diseases.



FRANK MITCHELL, ONE OF THE MOST PROGRESSIVE INDIANS ON THE LYTTON AGENCY

About ten years ago, an agitation was commenced in the province to have this state of affairs remedied, and, as a result, an appropriation was made by the Department of Indian Affairs for the cleansing of the Indian orchards in British Columbia. It was arranged that the Dominion Entomologist should administer the appropriation and have

direction of the work, and the writer was put in charge of operations. A general survey of the Fraser Valley was first made, and a large number of useless trees were cut down and destroyed. This was a grievance in the eyes of the Indians, who count so many trees belonging to them, irrespective of the area of land they occupy.

For two or three years after the work was started certain parts of the province were devastated by the attacks of tent caterpillars, which defoliated the orchards where they were not protected by arsenical sprays, and we were able to demonstrate to the Indians the benefits of spraying, although one of them remarked that he had never noticed any damage being done till we commenced to spray. Another was certain that it was the effect of the spray that gave his family "sore mouths" after eating the fruit. Certainly at the outset a good deal of difficulty was encountered, not only from the prejudice existing against spraying, but also from the apathetic nature of the Indians themselves. At first the work was undertaken by means of a couple of small sprayers, but on these being found to be inadequate several larger barrel pumps were added and now many of the Indians do their own work. We have over thirty of these barrel pumps in different parts of the province, and most of the Indians (in the orcharding parts of the province) have been instructed how to mix and apply the spray solutions. In some cases where the occupants are old or unable to do this, arrangements are made whereby the work is done for them. Instruction has been given from time to time in the correct methods of planting and forming the heads of the trees by pruning, and many of the Indians understand this fairly well, and even grafting itself is sometimes performed, in most cases successfully. In one promising orchard the "stocks" used were the



INDIAN WOMAN WORKING THE BARREL PUMP WHILE
HER HUSBAND SPRAYS

of their fruit in bulk, as do many of their white neighbours. Several Indians, however, do their own packing and marketing and have their boxes stencilled with their names and addresses, grade and variety. It is sometimes a little hard to keep up the interest in the work and perhaps the slightly indolent nature of the Indian is responsible for this, but although little or nothing can be done with the older generation, efforts are being made to get the pupils from the different industrial and boarding schools to take an interest in horticulture and some of them have been assisted, so that now there are some very excellent places where the work has been and is being done entirely by themselves.

In the Lytton Agency a very large area has been broken in and planted in fruit trees, which the Indians have purchased with their own money.

ordinary wild crab, *Pyrus revularis*. We have now several experimental orchards, put out by the Indians themselves, of trees supplied by the Department at the request of some of the different Indian agents. These were planted out under the personal supervision of the writer.

Two seasons ago we had two classes of young Indian men and women for the purpose of instruction in the best methods of apple packing. The first was composed of so many whites and so many Indians and the Indians beat their white competitors "hands down", Mr. Love-day, the instructor, being enthusiastic regarding their work. The other class was composed entirely of Indians and good progress was made. Now mutual instruction is given. Such packing classes can only be held where there are fairly large communities of Indians, but otherwise they are encouraged to dispose



INDIAN BOYS PLANTING ORNAMENTAL
SHRUBS AT THE SKWA INDIAN DAY
SCHOOL

In some cases advice was sought of the writer and where possible instruction was given.

Although there may be no great difference noticed from one year to another, when one compares the Indian places now with what they were some years ago, the improvement is very marked, and notwithstanding the fact that there are still some untidy fence corners, the Indian orchards may

safely be said to be clear of any serious insect pest, and efforts are continually being made to keep them so. The work has now extended far beyond its original purpose of "cleansing the Indian orchards" and embraces the whole problem of fruit culture, which offers a promising field of activity for the rising generation of those Indians whose reserves are located in good fruit-growing sections of the province.

THE DOMINION EXPERIMENTAL FARMS

EXHIBIT AT THE CENTRAL CANADA EXHIBITION

BY J. H. GRIDALE, B.AGR., DIRECTOR

AN educational exhibit, including many lines of work, was made by the Central Experimental Farm at the Central Canada Exhibition, Ottawa, which was held from September 9th to 16th. The exhibit was attractive as well as educational, and had been prepared by the officers in charge of the different lines of work at the Central Farm.

The Animal Husbandry Division display included models of different buildings and appliances for live stock, a collection of simple remedies, and samples of various dairy products, with excellent enlarged photographs of some of the different breeds of live stock, particularly of sheep.

The Field Husbandry exhibit consisted solely of a model of a farm, the principal features whereof were the rotations indicated as being the advisable ones to follow in Eastern Canada, namely: a 3-year rotation for soiling crops, or for farms where a large proportion of the land is not under cultivation, thus, first year, corn, or other hoed crop; second year, grain to be allowed to ripen, or cut green for forage; third year, clover; and a 4-year rotation that might be considered the standard rotation for the average farmer east of the Prairies or in British Columbia,

that is to say, first year, hoed crop,—corn, roots potatoes etc.; second year, cereals seeded down to clover, alfalfa, timothy, etc.; third year, clover-hay; fourth year, pasture or timothy hay.

The Forage Crops exhibit was devoted to seed production suggestions, with displays of mangel, turnip and clover seeds.

The Cereal Division exhibit included samples of grain in the sheaf and in bulk of the varieties best suited for Eastern Ontario and Quebec conditions, thus Huron and Marquis wheat, Arthur peas, Manchurian barley, Banner oats, etc.

The Horticultural exhibit included a large display of fine looking seedling apples that had been found quite satisfactory, that is to say, perfectly hardy and heavy yielders in Eastern Ontario and Quebec. These apples had all been bred at the Central Farm, Ottawa.

The Tobacco exhibit consisted of about a dozen show-cases, each including a full exhibit of some variety of tobacco possible of cultivation in Ontario or Quebec.

One of the most interesting exhibits was that of fibre plants, where every stage of the progress of flax, from the plant to the finished pro-

duct—in the form of table linen or finished garments —was well exemplified, and there was, in addition, an excellent collection of all the by-products from flax tastefully arranged, including cakes, meals, oils, etc.

The Chemical Division display included a collection of feeds and some graphic illustrations of the relative quantities of the different elements which enter into the make-up of some of them. In addition to this was included some interesting material on fertilizers, and the use of lime for soil improvement.

Probably the most attractive and, at the same time, one of the most interesting, exhibits, was that from the Poultry Division, where many appliances were shown in actual operation, as hovers, brooders, incubators, etc.

Almost equally attractive to the average visitor, however, was the

display made from the Apicultural Division, which included some excellent exhibits of honey and bee appliances, as well as a couple of glass-cased colonies, or part colonies, which were the centre of attraction to many people.

Exhibits from the Division of Botany included samples of different diseases of plants, thus enabling visitors to familiarize themselves with the peculiarities of different diseases and so be able to identify them when necessity arises. Besides this, there was an interesting exhibit of Medicinal Plants grown at Ottawa indicating that the production of these plants is quite possible under Canadian conditions.

On the whole, the exhibit was highly instructive and educational, and probably one of the best ever made by the Central Experimental Farm at the Ottawa Fair.

THE DIVISION OF BOTANY

THE GRAIN RUST IN THE PRAIRIE PROVINCES

BY THE DOMINION BOTANIST

A destructive epidemic of grain rust made its appearance in certain localities of the western provinces of the Dominion, as well as certain of the states of the American Union.

On the occasion of a trip recently made through the grain provinces, I examined as far as practicable into the extent of the rust damage of wheat. It is of course, quite impossible at the present moment, to make a statement in terms of dollars of the actual amount of injury this rust epidemic has inflicted on the grain crop of the Dominion. This, no doubt, will become fairly comprehensively apparent as soon as statistics of the total area under wheat and the results of yields have been obtained.

From my somewhat limited per-

sonal observation, I am in a position to say that certain farms with some 2,000 to 3,000 acres under wheat were observed to have crops unfit for any purpose whatsoever. The same has been said of the principal wheat growing areas of other parts of Manitoba; for there are in most localities some fields at any rate so much damaged by rust that the yield will not pay for the expense of cutting or threshing.

On inquiry, and from available official reports, I have learned that the rust was equally severe in the United States of America.

Since my work as plant pathologist is mainly concerned with causes and factors contributory to, or favouring the development of, such an extraordinary severe attack, I have been able to make some

observation which I think should be brought to the attention of grain-growers; since it must be realized that a neglect of all or any of the principal factors likely to have a restraining influence on rust, may result again, under like conditions, in an epidemic of similar nature.

CONTRIBUTORY CAUSES

It is generally accepted that unfavourable weather conditions will greatly increase the severity of rust. There can be little doubt as to the importance of this factor, since grain rust is more or less endemic, appearing every year; but serious epidemics only become observed when the climatic conditions are particularly unfavourable to the uniform development of the grain.

It would, however, be most misleading to hold the inclement weather conditions alone responsible for the severe losses experienced this year.

The fact that certain fields, surrounded by most virulently affected ones, though showing rust, yet were not by any means total failures—yielding some 10 to 12 bushels per acre—clearly indicates that, had all fields received similar treatment to those referred to, the losses, in spite of the unfavourable weather, could not have been so severe everywhere.

It seems quite clear that lessons of considerable interest may be learned from a careful investigation into the reason for the escape of certain limited areas. From personal observation made throughout the Dominion almost since the establishment of this Division (1909), and also from such limited experiments as could be conveniently undertaken from time to time by this Division, several important factors have been recorded, and may be summarized as follows:

GENERAL CONSIDERATIONS

Grain Rust is due to one of the most prominent members of the group of "absolute" parasitic fungi.

These may attack any portion of leaves or stems of the growing grain plants (Wheat, Oats, Barley, etc.).

Certain conditions have been observed preceding and during rust epidemics, which appear to predispose, or to render more easily susceptible, the growing plants to parasitic disease.

The study of all such contributory factors, as far as known at present, and their elimination through special efforts, will, as practice has shown, greatly reduce losses from rust, even in years of extraordinary severity.

The principal factors concerned are weather the thorough preparation of the seed bed, the use of superior seed grain of strong germination, the choice of early maturing varieties, and early sowing.

IMMEDIATE RECOMMENDATIONS CONCERNING REDUCTION OF RUST

Conditions over which a farmer has no control cannot of course, be eliminated, but it appears absolutely essential that he should do his best to eliminate each and every factor over which he has control. Failure of the crop may be due to neglecting only one of the factors referred to.

1. The foremost condition for the farmer to fulfill, whatever the soil or weather conditions may prove to be, is the use of superior seed grain of strong germination, i.e.—new seed. The more rapidly and uniformly 90 to 95 per cent of the seed germinates, the less will be the danger from struggling plants, and decidedly less the probability of rust injury. Seed of feeble germinating energy is sure to suffer considerably from rust in any case.

2. The choice of early varieties, otherwise satisfactory as far as yield and quality are concerned, is recommended. It has been commonly observed that early maturing varieties were past the stage of infection at the time when rust infection seriously injured late varieties.

3. More important even than early varieties appears to be early sowing of grain. Experiments undertaken quite recently at the Central Farm clearly show that wheat proved decidedly more free from rust when sown early; whereas late sown wheat of the same variety produced practically no grain through rust. The same recommendations concerning early sowing are contained in the final reports of grain rust commissions of Europe and Australia.

4. The preparation of the land before seeding is also an important factor. The more thoroughly land is prepared for the reception of seed, the better is the chance provided for uniform germination and for an even development of the root system; and from good seed more vigorous plants will be provided, which usually escape severe injury from rust, even though the weather may be at times not all that is desirable.

RECOMMENDATIONS CONCERNING FUTURE MEANS OF RUST ELIMINATION

This report would not appear complete, should I not point out the urgent necessity for research work still most essential in the Dominion. There are a large number of factors in the annual repetition of rust that are by no means understood, and, not before these points have been solved or are better understood, will it be possible to eliminate or meet the losses from grain rust, which cause every year most serious economic losses to our grain producers. These losses amount to millions of dollars every year; this year the losses will be extremely heavy.

SPECIAL RESEARCHES REQUIRED IN THE INTEREST OF THE PUBLIC

Several of such points for investigation may be briefly indicated here.

1. *Grain Rust and the Barberry in Canada*:—The Grain Rust (*Puccinia*

graminis) passes a part of its life cycle on the common barberry. In Europe the common barberry appears to be solely responsible for the perpetuation of the rust. Of this there can be little doubt; although experiments conducted by this Division here and elsewhere in Canada have shown that the barberry certainly increases grain rust when grown in close proximity to grain fields, yet this shrub is almost entirely absent in the Western Provinces. The few plants that are grown for ornamental purposes are generally quite orange with the spores that produce grain rust. If it is desirable to eliminate all factors known to contribute to the maintenance of grain rust, over which we have control, then the barberry should certainly be destroyed wherever it is found growing. The barberry has no special merit, it is not particularly attractive, and yet, although suggestions have been frequently made from this office to rid the country of this shrub, objections seem to be raised all the time.

It must be clearly understood that the destruction of the barberry would not eliminate grain rust, but it should be regarded as necessary in order to prevent each and every contributory cause.

Since the barberry is almost, but not entirely, absent in the Western area of Canada, there must exist other means by which grain rust is carried over from year to year. Absolutely nothing definite is known on this point.

2. *How is the rust carried over from season to season?* Research work along this line is urgently needed, for light on these most important points, —where and under what conditions rust may be dormant from the time of harvest to sowing the grain again, —might enable us to destroy such stages effectively, and thus contribute largely to the elimination of this most destructive of all economic plant diseases.

3. *Susceptibility versus resistance of grain varieties.* Then there are studies of susceptibility of varieties of grain, which are most important. It has not yet been determined anywhere which is the most vulnerable stage, condition or period of the wheat plant towards an attack by rust.

Furthermore, there appear from time to time reports in the agricultural press relating to rust-resistant varieties. It may be said here that there exists no evidence as yet that rust-resistance may be or has been attained in the slightest degree. Rust-resistance is no doubt an acquired character. The perpetuation by seed of acquired characters is still a question open to dispute, but where progress and research are needed is in a study of the bionomics of the wheat plant and its varieties. Since there cannot be any doubt that,

within the constitution of varieties, one would be able to develop early maturity, rapid development, and other transmissible factors, that may contribute very largely to the elimination of severe losses from rust.

ESTABLISHMENT OF RUST RESEARCH LABORATORIES URGENTLY NEEDED

Such research work must be carried on in stations situated right in the grain-growing district, preferably in a series of stations throughout the grain-growing regions. At least two such stations are urgently needed. One to be situated in Manitoba (Brandon), and one in Saskatchewan (Indian Head).

NOTE.—The Honorable Arthur Meighen, Acting Minister of Agriculture, has authorized the establishment of the two research laboratories recommended in the last paragraph. Their erection will be proceeded with at once.—*Editor.*

THE SEED BRANCH

TIMOTHY SEED SHIPMENTS

BY GEO. H. CLARK, SEED COMMISSIONER

THE 1916 crop of Alberta timothy seed would seem to require special facilities for marketing and the following tentative arrangements have been made, subject to change as experience in handling the seed may warrant.

1. The Dominion Department of Agriculture and the Board of Grain Commissioners agree that the widely and favourably known system for grading, handling and marketing of grain should so far as possible be made available for timothy seed.

2. For this year the government interior terminal elevator at Calgary will be fitted for the handling of timothy seed. Timothy seed will be received in bags, the bags returned to the shipper whose name is contained thereon, farmers' lots being kept separately though in quantities of less than car lots. The seed will be cleaned and graded and ware-

house certificates issued for the net weight and grade or grades of seed obtained after cleaning. The total charge for receiving, cleaning, elevating, sacking and loading ex-elevator will be five cents per cwt. Large bins will be provided for Extra No. 1, No. 1, No. 2, No. 3 and rejected grades. After cleaning, a farmer's lots of timothy may not retain its identity, but may be bulked with other lots of the same grade.

3. Alberta timothy seed growers will do well to remember that upwards of two million bushels of timothy seed are produced annually in the North Central states; that this seed is marketed, commencing about August 15th, and that agents of the large American seed houses canvas Eastern Canada, taking orders during the months of November, December and January, for

seed to be delivered the following spring. It is, therefore, highly desirable that Alberta timothy seed growers should hold warehouse receipts for their re-cleaned and graded seeds as soon as possible, so that the quantity of timothy seed available, together with the holders of warehouse certificates may be listed from week to week for the information of prospective buyers.

4. The Chicago market virtually controls the world's prices for timothy seed. The freight rates on

seed from Chicago to points in Eastern Canada, plus the import duty, are approximately equal to the prevailing freight rates between Alberta points and Toronto or Montreal.

The secretary of the Calgary Grain Exchange has undertaken to procure the closing prices for prime timothy seed on the Chicago Grain Exchange from day to day, and provide such information for general publication in Alberta daily newspapers.

THE DAIRY AND COLD STORAGE BRANCH

PRECOOLING RASPBERRIES

BY EDWIN SMITH, B.Sc., IN CHARGE OF THE GRIMSBY PRECOOLING PLANT

RASPBERRIES commonly sell for \$4 per 24-pint crate in Winnipeg, Brandon and at other western points. These prices and the fact that the supply of berries in these markets at present lies in the United States (Puyallup, Wash.), has called the attention of Canadian raspberry growers to long distance shipments. The distance from Puyallup to Winnipeg is somewhat greater than from Mission City, B.C. (the latter being 1,442 miles), while from the Niagara district to Winnipeg the distance is but slightly over 1,300 miles, and is several hours shorter on an express shipment.

In 1914 and 1915 trials were made by shipping raspberries in precooled freight shipments from Grimsby to Winnipeg. Although only six days in transit the berries arrived in a mouldy condition. This, together with tests in storage at 40 degrees, indicated that it would be necessary to ship refrigerated express.

In 1916 arrangements were made with E. D. Smith and Son of Winona to ship a precooled car of sour cherries refrigerated express, the Department paying the difference between the

freight and express rates, being given the privilege of including a sufficient quantity of raspberries in the car to make a satisfactory test.

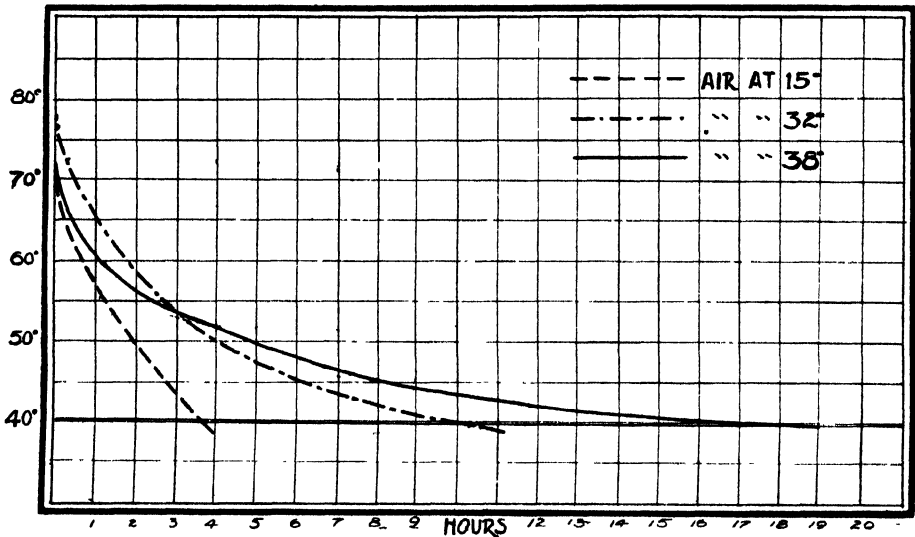
The raspberries (Cuthbert variety) were picked and packed by the growers on July 25th in 24-pint Hallock crates. In some instances the growers packed in old 4/5-quart boxes and transferred to the pint boxes. This practice would tend to interfere greatly with the good carrying qualities of the fruit. The berries were in a better condition for long distance shipment than in average years on account of the exceptionally dry weather.

The berries as well as the balance of the fruit were precooled to 38 degrees over night and loaded in an iced refrigerator car July 26th. One tier of berry crates was loaded in the end of the car near the ice while another was placed in the centre of the car.

A thermograph placed in the centre of the car on the floor made a record showing that the temperature within the car rose from 38 degrees to 51 degrees during the two-day trip (as typical illustration of the inefficiency of refrigerator cars).

The car was opened July 28th, and the berries were in perfect condition. Inspection made by Mr. Joseph Carman, Dominion Fruit Inspector, showed the only fault to lie with the poorly filled boxes. This was a fault on the part of the growers noticeable before the fruit left the precooling plant. It was further reported to the inspector that the berries did not hold up well upon removal from the car, upon the second day serious deterioration being experienced. The raspberries sold readily for from \$3 to \$3.50 per 24-pint crate. The express

short length of time the Cuthbert raspberry from Ontario will undergo shipment,—four days being the limit even when precooled. The raspberry as grown in Ontario is entirely different from the same varieties of fruit grown under Pacific coast conditions. The raspberry as grown about Mission City and Hatzie, B.C., is so similar to the fruit grown about Puyallup, Wash., that western growers should refer to Bulletin No. 274 of the United States Department of Agriculture, Washington, D.C., in which Mr. H. J. Ramsey gives the



RATE OF COOLING RASPBERRIES IN 24 4/5 QUART CRATES WITH SURROUNDING AIR AT 15, 32 AND 38 DEGREES, RESPECTIVELY

rate from Grimsby to Winnipeg is \$2 per cwt. As about 700 crates are conveniently loaded in a car the transportation and icing charges amount to about 60 cents per crate. This indicates that it is reasonable to expect that precooled raspberry shipments to Winnipeg will be possible and profitable in future years, although it is highly desirable that further tests be made in other seasons before fruit shippers take it upon a large scale.

Shippers in British Columbia undoubtedly will be surprised at the

results of some excellent work with raspberry shipments from the Puyallup district.

Investigations at Grimsby show that as good results are obtained in precooling raspberries with low temperatures (as low as 15 degrees) as with those above freezing, providing the cooling is stopped after the temperature of the fruit reaches 38 degrees. The accompanying diagram shows the rate of cooling in the centre of a berry crate when the temperature of the surrounding air was maintained at 15 degrees, 32 degrees

and 38 degrees. Fruits as perishable as the raspberry should be held up in transit for precooling purposes as little as possible, so that temperature between 15 degrees and 20 degrees should be used cooling the raspberries from 70 degrees or 75

degrees to 40 degrees in from 3½ to 5 hours. If overnight cooling is to be resorted to, a temperature of from 28 degrees to 32 degrees may be used, lowering the temperature over the same range in 10 or 12 hours.

THE LIVE STOCK BRANCH

THE EGG SITUATION

BY J. H. HARE, B.S.A., OF THE POULTRY DIVISION

CANADA has suddenly become an exporter of huge quantities of eggs. We have passed from an importing country to an exporting country. Only four years ago, we were huge importers of eggs. Our home requirements were then far greater than our production. In 1913, we imported over thirteen million dozen. Since that time production has so increased that last year we exported a surplus of over seven million dozen.

This brings up the question: What about a permanent outlet for this growing surplus? The past year a ready market was found in Great Britain, but that was chiefly on account of war conditions. Great Britain has been suffering a comparative famine in respect to eggs. Her usual sources of supply have been partially cut off by the war, and conditions have been such that a good price has been paid for in-different stock from any source. This condition, however, is likely to cease when the war concludes. The near-by countries will resume their flow of eggs to Great Britain and, in order to get a foothold on that market, we shall then have to meet the competition of such countries as Denmark, Holland and Ireland. We shall not do this successfully unless there is a big improvement made in the quality of the stock we produce and export. This is apparent from the fact that Canadian

prices in Great Britain always are quoted considerably below Danish and Irish prices.

IMPROVEMENT A NECESSITY

Unless something is done to improve the quality of Canadian eggs, we are likely to find after the war that we shall be in a serious plight to know what to do with our surplus supplies. If there is no possible outlet and the surplus is thrown back upon our own already satisfied market, a seriously demoralized condition is sure to follow. How best can we provide against this contingency? How can we build up this foreign trade, developing a reputation for Canadian eggs and a strong export demand? We could not follow a better course than was followed by Denmark, Sweden and Ireland. These countries have formed egg circles, or marketing associations. They have developed and extended these until they each now have a national organization with a large portion of their output passing through these co-operative channels. The co-operative supplies are of a specified standard. They are uniform in grade. They can be depended upon. Immense supplies have come from these countries and have been placed on the British market. They have met with favour. The co-operative associations in their rigid adherence to their uni-

form standards have induced regular dealers to follow their lead until the whole trade has been revolutionized and they have won for themselves a premier place upon the best markets of the world.

CANADA'S OPPORTUNITY

We have the same opportunity before us in this country, and I believe that co-operation will do for us as much as it has done for Denmark. We already have good evidence on this point. Some five or six years ago Prince Edward Island eggs had about the worst reputation of any eggs going upon the Montreal market. A co-operative association was formed which now handles about 60 per cent of the output of that province. Last year a quarter of a million dollars' worth of eggs were sold through this association. It is the practice of this association to grade carefully, honestly and according to a definite standing. As a consequence it has won for the Island a reputation for its products such as is not enjoyed by any other province in the Dominion. Last year one Montreal firm bought from the Island association several thousand cases. Having already had some

experience with the association and its methods of grading and packing, this stock was directly placed in cold storage in the original cases without further examination. Later on this stock was taken out of storage and sent across to Great Britain without examination. The goods gave perfect satisfaction, and on the strength of this experience the same firm has bought this year thousands of cases from the Island association for the same purpose.

A UNIFORM SYSTEM REQUIRED

There should be in the whole of the Dominion a uniform system such as has been developed in Denmark, Sweden and in the province of Prince Edward Island. There must be a unification of all forces, a co-ordination of all efforts into one large national undertaking. It should be our aim as far as possible to link up all the provinces in the Dominion in a uniform movement with a view of accelerating production by perfecting a system of marketing, but particularly with a view of developing our export trade, and otherwise making provision for the extension and expansion of the industry.

PRELIMINARY REPORT OF WOOL GRADING OPERATIONS, 1916

BY T. REG. ARKELL, B.S.A., CHIEF OF SHEEP DIVISION

UNDER the Markets Policy of the Dominion Live Stock Branch, expert graders have assisted co-operative associations of farmers in preparing their wool for market. Grading operations have

been performed in all the provinces of Canada and the amount of wool prepared in this manner much exceeds that of any previous year. The following represents a preliminary report. A more detailed account will follow in a later issue.

RANGE WOOL GRADING STATEMENT

(RANGE REFERS TO WOOL PRODUCED UNDER RANCHING CONDITIONS)

NAME OF ASSOCIATION	Fine Staple	Fine Clothing	Fine Medium Staple	Fine Medium Clothing	Medium Staple	Medium Clothing	Low Staple	Rejections	Gray and Black	Locks and Pieces	Tags	Total Weight	Total Fleece
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Saskatchewan.....	306	197	1023	310	2583	162	553	153	98	1	74	885	825
Alberta Provincial (Alta.)	182	1866	4682	929	398	480	..	..	..	..	..	9597	1219
Southern Alberta.	41322	49246	140621	19698	156886	3682	43422	257	3428	4320	974	463856	71362

*Not complete.

***Not complete.**

DOMESTIC WOOL GRADING STATEMENT

(DOMESTIC REFERS TO WOOL PRODUCED UNDER FARMING CONDITIONS)

NAME OF ASSOCIATION	Fine Clothing	Fine Medium Clothing	Medium Clothing	Low Medium Clothing	Fine Combing	Medium Combing	Low Medium Combing	Lustré Combing	Coarse Combing	Refec-tions	Gray and Black	Locks and Pieces	Tags	Miscel-laneous Mohair, etc.	Total Weight	Total fleece
Compton, Que.	Pounds 151	Pounds 174½	Pounds 189	Pounds 7457½	Pounds 775	Pounds 712	Pounds 314½	Pounds 59½	Pounds 5	Pounds 12	Pounds 118½	Pounds 31	Pounds 12	Pounds 5	Pounds 24387½	Pounds 3491
Stanstead, Que.	Pounds 258½	Pounds 528	Pounds 183	Pounds 4407½	Pounds 775	Pounds 712	Pounds 314½	Pounds 59½	Pounds 5	Pounds 12	Pounds 118½	Pounds 31	Pounds 12	Pounds 5	Pounds 24387½	Pounds 3491
Sherbrooke, Que.	Pounds 100½	Pounds 63	Pounds 206	Pounds 2238	Pounds 4407½	Pounds 712	Pounds 314½	Pounds 59½	Pounds 5	Pounds 12	Pounds 118½	Pounds 31	Pounds 12	Pounds 5	Pounds 24387½	Pounds 3491
Mégantic, Que.				Pounds 3063½	Pounds 736½	Pounds 14½	Pounds 48½	Pounds 6½							Pounds 13587	Pounds 475
Beauharnois, Que.				Pounds 2385	Pounds 5235	Pounds 3422	Pounds 139	Pounds 60							Pounds 10769½	Pounds 1545
Argenteuil, Que.				Pounds 4927	Pounds 392½	Pounds 445	Pounds 375½	Pounds 164							Pounds 15091	Pounds 2066
Bedford, Que.				Pounds 5637	Pounds 509½	Pounds 562½	Pounds 293½	Pounds 195							Pounds 17664½	Pounds 2343
Richmond, Que.				Pounds 11144½	Pounds 6300½	Pounds 81	Pounds 562½	Pounds 556							Pounds 52565	Pounds 7216
Pontiac, Que.				Pounds 22338	Pounds 20195	Pounds 5434	Pounds 248	Pounds 27½							Pounds 42965	Pounds 4395
Prince Edward Island				Pounds 3136½	Pounds 1679	Pounds 20056½	Pounds 248	Pounds 27½							Pounds 11192	Pounds 193
Guyshoro, N.S.				Pounds 247	Pounds 234	Pounds 637½	Pounds 84	Pounds 46							Pounds 17388	Pounds 3247
Antigonish, N.S.				Pounds 3866½	Pounds 765	Pounds 466½	Pounds 14	Pounds 49							Pounds 1804	Pounds 271
Kent & Westmoreland, N.B.				Pounds 509½	Pounds 1050	Pounds 38	Pounds 53	Pounds 135							Pounds 3253	Pounds 489
Sussex & Studholm, N.B.				Pounds 121	Pounds 980	Pounds 380	Pounds 53	Pounds 135							Pounds 17991	Pounds 2113
Manitoulin, Ont.				Pounds 102	Pounds 7951	Pounds 1379	Pounds 66	Pounds 340							Pounds 9940	Pounds 1320
Elkhorn, Man.				Pounds 2296	Pounds 2257	Pounds 531	Pounds 76	Pounds 2967							Pounds 141631	Pounds 18910
Manitoba Provincial				Pounds 4412	Pounds 36769	Pounds 1557	Pounds 159	Pounds 914							Pounds 171129	Pounds 24447
Saskatchewan				Pounds 32976	Pounds 54448	Pounds 14160	Pounds 1519	Pounds 393							Pounds 43322	Pounds 6189
Alberta Provincial, Edmonton				Pounds 1207	Pounds 2753	Pounds 403	Pounds 478	Pounds 124							Pounds 33901½	Pounds 2577
Vermilion, Alta.				Pounds 8695	Pounds 19431	Pounds 383	Pounds 94	Pounds 133							Pounds 20246	Pounds 39948
Pincher Creek, Alta.				Pounds 1786	Pounds 12854	Pounds 395	Pounds 94	Pounds 437							Pounds 279639	Pounds 3568
Alberta Sheep Breed-ers' Calgary				Pounds 51373	Pounds 116230	Pounds 6642	Pounds 2522	Pounds 5248							Pounds 212	Pounds 39948
Leacombe, Alta.				Pounds 2561	Pounds 20094	Pounds 489	Pounds 67	Pounds 293							Pounds 35	Pounds 36064
Vancouver Island.				Pounds 245	Pounds 15745½	Pounds 53	Pounds 36½	Pounds 731							Pounds 21756	Pounds 3106

PART II

Provincial Departments of Agriculture

AGRICULTURE IN CANADA

MANITOBA

BY GEORGE BATHO, EDITOR OF AGRICULTURAL PUBLICATIONS, MANITOBA DEPARTMENT OF AGRICULTURE

NOT only is Manitoba in the heart of Canada geographically, but in many other respects it stands, in the conditions which it represents, about midway between the extremes. More than any other province in the Dominion, it blends the maturity and development of the East with the opportunity and freshness of the West.

AREA AND DESCRIPTION

The total area of Manitoba is 251,832 square miles, of which, roughly, about nine-tenths is land surface and one-tenth water. The extreme distance north and south is 756 miles, and the greatest width is 492 miles. For the time being, however, these figures are practically meaningless, as the great stretches of the new northern hinterland, which in 1912 were added to the almost perfect square that the province formerly presented, are not as yet occupied or exploited except by a few fur traders and prospectors. Putting our tape across the southern and older portion of Manitoba, the once dubbed "postage stamp" part of the province, we find that it extends 276 miles east and west, and measuring southward to the international boundary line from Bowsman, which is the most northern

agricultural settlement, we have a distance of 225 miles. Even these figures might suggest a very exaggerated notion as to the amount of land occupied for agricultural purposes, for, even though Manitoba is the longest-settled of the three prairie provinces, it has still big areas of arable land that are not occupied by farmers. The official returns for the current year show us that Manitoba has, in 1916, a total area under all crops of 6,583,387 acres which, if all pushed together into a solid square block, would measure 101 miles either way. These figures, however, take no account of lands being summer fallowed, nor yet of those being used for pasture, and the latter, especially, would be hard to gauge, as with so much unfenced area, where occupancy is as yet on a free and easy basis, it is very difficult even to estimate what acreage of land is grazed.

The two principal variations from the agricultural landscape which are to be found in the southern half of Manitoba are the three big lakes (Winnipeg, Manitoba and Winnipegosis), and the hilly timbered country known as the Duck Mountains and the Riding Mountains. When it is observed that Lake Winnipeg is 250 miles in length and 65 miles wide, it will be seen that these

natural features are of considerable account, and no doubt they exercise an influence upon the climate in the way of increasing summer rainfall and comparative immunity from summer frosts.

The altitude of most of the agricultural land of Manitoba lies between 750 feet and 1,700 feet above sea level. The Red River valley lands lie lower than any other area now being farmed in the province, and the most elevated lands occupied are along the south slopes of the Riding Mountains, where some very excellent farms are well up to the maximum heights of these hills.

The subsoil almost universally is clay, with a dark mould overtop. In the Red River valley the soil is much heavier and denser than farther west, where, mainly, the top stratum has in it a generous admixture of sand. Though boulders abound in a few areas, the older portion of the province as a whole is largely devoid of loose surface stones, there being in many localities not enough for building foundations.

Perhaps three-quarters of that portion of the province so far settled was found by the farmer in a condition of open prairie, while the other one-quarter has been lightly timbered, mainly with scattered groves of aspen poplar and in some cases by willows or thinly studded scrub oaks. The open prairie being the easiest of all kinds of wild land to bring under the plough it is natural that it should have been selected for the earliest settlement. That the wooded land, when cleared, is just as productive, is the general experience of those farming in these areas.

The availability of good supplies of drinking water varies according to locality, but, generally speaking, well water is readily obtained at depths of less than fifty feet.

GENESIS OF MANITOBA AGRICULTURE

The earliest agricultural settlement to be established in Manitoba

was that made by the Red River colony, which, coming in by way of Hudson Bay, and boating southward over Lake Winnipeg, on August 30th, 1812, pushed its canoes to land on the east bank of the Red River, immediately north of the spot where the city of Winnipeg now stands. The history of this early colony is very largely a story of hardship and suffering, but the site of the earliest settlement still possesses a number of families who are the descendants of the Selkirk settlers. The relics of the agriculture of that day show how primitive the farming of that time really was.

For almost sixty years after the arrival of the Selkirk settlers Manitoba attracted scarcely any further notice as a place for agricultural settlement. In 1870 the province entered confederation, and two years later one of the largest early colonies arrived, these being the Mennonites, who came from Southern Russia and settled in the Red River valley, close to the international boundary line. The census figures of 1881 show that there were then 7,776 Mennonites in Manitoba, and these practically all came to the country in the one movement. The settlement still remains in its original location.

From quite early times a few settlements of French speaking people have been assembling themselves here and there in the province, mostly in the Red River valley, and these settlements are practically solid and undisturbed to-day.

But by all means the greatest factor in the agricultural colonization of Manitoba was the westward flow of British-bred stock from the province of Ontario, and this movement set in during the latter part of the "seventies" and early "eighties," gaining perhaps its maximum early magnitude in the "boom" year of 1882. Though varying somewhat from year to year, this movement has to some extent been going on ever since. Thus the main part

of the early stock of Manitoba is of Ontario origin; and right good stock it is.

During the past twenty or thirty years the immigration to the province has been of a decidedly mixed nature until now the people of Manitoba are of quite a cosmopolitan complexion. This remark especially applies to those in our cities, but not exclusively so. Here and there are rural areas in which are large admixtures of people from Iceland, Sweden, Norway, Austria, Hungary, Germany, Russia and Belgium, while the British Isles, the United States and all the eastern provinces of Canada have supplied their quota.

CLIMATE

I spoke at the outset of Manitoba as a province not greatly given to

extremes, but perhaps that remark is scarcely applicable to the climate. The Manitoba climate is positive. The summers are warm and the winters are cold. Rainfall between October 31st and April 15th is very rare. Our annual precipitation at Winnipeg averages 20.42 inches, of which 10.9 inches fall during the four months of summer growth, May, June, July and August. As a rule the late autumn months are dry and fine, and the snowfall of the winter is much more scant than in those places of moister atmosphere. The climate is very uniform over the entire province.

TRANSPORTATION

The settled portion of Manitoba is well supplied with railroads. The various steam railroads have within the province the following mileages:



THIS PICTURE TAKEN ON THE BRANDON EXPERIMENTAL FARM SHOWS THE VARIETY OF TREES THAT MAY BE GROWN IN MANITOBA

	Miles
Brandon, Saskatchewan & Hudson Bay Railway.....	69.45
Canadian Northern Railway.....	2,215.39
Canadian Pacific Railway.....	1,728.1
Grand Trunk Pacific Railway	306.5
Manitoba Great Northern Railway.....	91.77
Midland and Manitoba Railway.....	6.4
National Transcontinental Railway.....	94.
Greater Winnipeg Waterways Railway.....	91.
Total.....	4,602.61

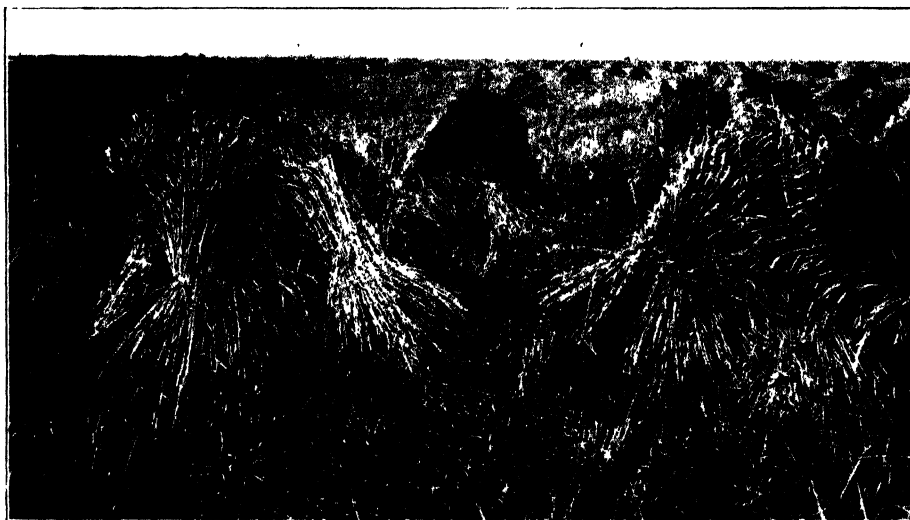
When the partially built Hudson Bay railway is completed, a new route across the Atlantic will be open. The extent to which this route will serve Manitoba remains as yet to be seen.

By all means the largest class of eastward going freight is grain, and the comparative proximity to the head of the Great Lakes enjoyed by Manitoba is much in its favour. The freight rate on grain from Winnipeg to Fort William or Port Arthur is 10 cents per 100 pounds, or 6 cents per bushel for wheat. Almost all of

Practically all the commercial live stock shipped within the province passes through the Union Stock Yards at Winnipeg, the receipts from Manitoba points during the years 1914 and 1915 being as follows:

	1914	1915
Cattle...	46,730	69,972
Sheep...	13,290	8,169
Hogs...	131,637	124,390
Horses...	1,069	2,770

The following summary of maximum and minimum prices per 100 pounds paid for choice cattle and hogs at the Union Stock Yards, for



MANITOBA PRODUCED NINETY-SEVEN MILLION BUSHEL OF WHEAT IN 1915
There are still Thousands of Acres like this in Manitoba available for Settlement.

the grain grown in Manitoba enjoys a rate of not more than 13 or 14 cents per 100 pounds.

MARKETS

Manitoba's markets lie to the east and south. Her cereal shipments are almost entirely sent to Europe and the provinces farther east. Her cattle are well divided between the markets of the east and those of the United States, while her hogs and bacon are mostly sent eastward.

each month of the year 1915 furnishes a basis for comparison with the markets for live stock elsewhere:

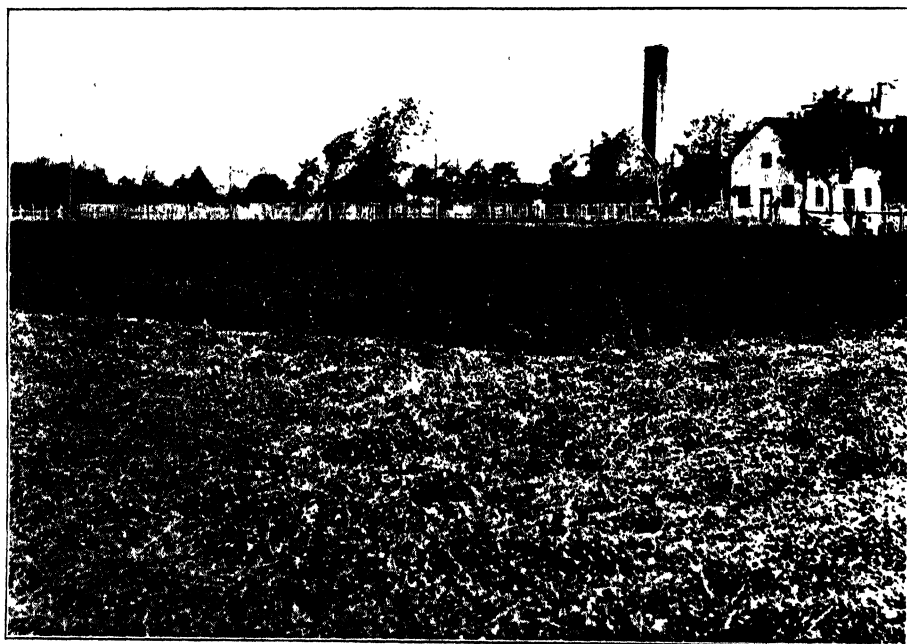
	Cattle		Hogs	
January...	\$6.50 to	\$7.25	\$6.75 to	\$7.25
February...	7.00 "	7.50	6.90 "	7.35
March....	7.15 "	7.60	7.15 "	7.80
April.....	7.25 "	8.50	7.90 "	8.35
May.....	8.50 "	9.15	7.90 "	8.85
June.....	8.25 "	8.85	8.00 "	8.75
July.....	7.25 "	8.85	8.00 "	8.75
August....	7.25 "	8.00	8.00 "	8.75
September	6.65 "	7.50	9.00 "	9.50
October...	6.50 "	7.15	8.40 "	9.50
November	6.50 "	7.05	8.50 "	9.25
December.	6.50 "	7.10	8.40 "	9.10

AGRICULTURAL PRODUCTION

The phrase "Manitoba Hard" wheat, together with the world-wide reputation for excellent milling quality that that product has gained, has caused many folk to think of this province as though wheat growing were our only agricultural ambition. This is not the case. There are several areas, especially in the

parts with the higher altitudes, where oats are grown more extensively than wheat, and live stock, especially cattle and swine, are receiving more and more attention from year to year.

Cereals.—Taking the figures for each fifth year from 1885 to 1915, we have this record in cereal production:



ALFALFA GROWING ON THE ASYLUM FARM, SELKIRK, MANITOBA
This shows the First Cut, taken June 15th, 1915.

YEAR	Wheat, Acres	Oats, Acres	Barley, Acres	Flax, Acres
1885	357,013	157,026	51,189	
1890	746,058	235,534	66,035	
1895	1,140,276	482,658	153,839	82,668
1900	1,457,396	429,108	155,111	20,437
1905	2,643,588	1,031,239	432,298	24,707
1910	2,962,187	1,486,436	624,644	41,002
1915	3,664,281	2,121,845	1,039,849	64,863

Ten-year averages as to yield are very satisfactory and informing figures, and the following are the

official averages of yields per acre for the years 1906 to 1915 (inclusive):—

	Ten-Year Average per Acre
Wheat.....	18.4 bushels
Oats.....	39.4 "
Barley.....	28.5 "
Flax.....	12.1 "

Potatoes and Roots.—Though potatoes and all root crops grow luxuriantly in Manitoba, the acreage devoted to them is comparatively small. Potatoes are grown only for local consumption, and although farmers could use very many more roots for live stock feeding, the general shortage of farm help, together with the keen freezing nature of our winter, has restrained them from doing so. The figures for 1915 were as follows:

boundary of the province. Fodder corn has commanded an increasing measure of attention during the past few years, and there were grown last year 52,713 acres.

Cattle.—Manitoba was never, even in the "early days", devoted to that romantic type of open grazing on the public domain that flourished farther west. There were two reasons for this. One was that once the flow of settlers began to move westward the wheat growing possibilities of Manitoba lands were at once patent, and the settlement became too dense for large ranch companies to occupy. The second reason was that our



COWS SECURED FOR DISTRIBUTION TO MANITOBA SETTLERS UNDER THE SETTLERS' ANIMAL PURCHASE ACT, 1916

	Area, Acres	Average Yield, Bushels
Potatoes.....	67,343	114.8
Roots.....	17,352	179.5

Fodder Crops.—As yet the greatest source of hay supply in Manitoba is the native grasses of the prairie, and many of these produce hay very rich in nitrogen. Still these are not the only grasses grown. Western rye grass, awnless brome, and timothy are all sown somewhat, while alfalfa and red clover are also used to a lesser extent, the latter being most successful in the Red River valley and from there to the eastern

grasses, having a generous supply of summer rainfall, remained unripe until too late in the season, and this, together with our usually constant carpet of snow, made it difficult for cattle to "rustle" a living during the winter without hand feeding. But we have a good climate for all classes of live stock, and, although our winter temperatures are low, it is remarkably easy to provide sufficient shelter for animals. As indicating this fact, it is noteworthy that experiments in steer feeding at the Brandon Experimental Farm, con-

ducted now for several years, go to show that where tree shelter is available for fattening animals, they will make almost as good gains as those in barns, or at least so close that the advantage of the barns would scarcely pay for their building. This refers to fattening steers; with milch cows and young stock it is quite different.

The beef breeds predominate, the Shorthorn being the favourite, with the Hereford and Aberdeen-Angus less freely represented. The Holstein, Ayrshire and Jersey are the most popular dairy breeds.

The present year has seen the inauguration of a new policy on the part of the Provincial Government in the way of aiding settlers who are financially unable to stock their land with cattle. Into some of the newer districts, where there is abundance of pasturage, but where the lands are not first-class cereal areas, colonists have gone without sufficient capital to stock their lands with animals. Under the new Settlers' Animal Purchase Act, cows are supplied under lien to these settlers. It is as yet too early to record the outcome of this scheme.

Horses.—Manitoba has not produced horses to export to any extent; indeed, during the past 20 years the province has imported more horses than it has shipped out. This has largely been because of the expansion of acreage being cultivated, rather than because of any natural difficulty in the way of horse raising. The class of horse being reared is generally of a superior type, the heavy breeds having a decided preference.

Commencing with this season a new Stallion Enrolment Act is operative, which provides that all stallions stood for public service at a fee shall be pure-bred and enrolled with the provincial Department of Agriculture, acting in concert with the Stallion Enrolment Board. A less advanced system of stallion enrol-

ment (which permitted grade stallions also to stand for service) has been in vogue for a few years past. The figures of 1915, the latest available, show that stallions enrolled were divided among the breeds thus:

Clydesdales.....	505
Percherons.....	157
Shire.....	19
Suffolk.....	5
Draught.....	26
Hackney.....	21
Coach.....	5
Thoroughbred.....	15
Standard-bred.....	44
Grades.....	175
Total.....	972

Sheep.—Sheep keeping has never been a very important branch of Manitoba farming. This is not because our lands, our climate or our feeds are unsuitable. Indeed, sheep thrive remarkably well in Manitoba; but the occasional annoyance by coyotes, together with the fencing problem, have been the chief deterrents in sheep expansion. During the past five years, however, there has been an ever-growing increase in the number of farm flocks established. During the years 1915 and 1916 the Manitoba Department of Agriculture, acting as agent for the farmers, has sold on a co-operative basis all wool consigned to it for sale. Through the kindness of the Dominion Department of Agriculture, this wool has all been graded by a Dominion Government wool grader; and it is significant that whereas last year about 70,000 pounds were sold, this year the amount consigned amounted to approximately 160,000 pounds. The price realized last year was 26.8 cents; this year it has been 31.9 cents.

Several breeds of sheep are kept in Manitoba, but the Down breeds really predominate, with a considerable sprinkling of Leicester blood.

Swine.—Pig raising has always occupied an important place in Manitoba agriculture, and it is safe

to say that the popularity of the hog will continue. The bacon type finds almost exclusive favour, although of late years the Poland China breed has attracted more attention to the lard type of hog. In the city of Winnipeg are several large packing houses, and a considerable proportion of the hogs reaching Winnipeg are made into bacon and hams within the province.

Dairy Products.—The strongest feature of Manitoba's dairy enterprise is factory butter-making. Within the province are 36 cream-

Within the past decade one very important development has occurred in connection with Manitoba dairying. This is the centralized creamery movement. Today the patrons of creameries are not confined to the wagon range of a local butter factory. The large city creameries, doing an ever-increasing business, receive no cream except that coming by rail, and almost every railway train carries its load of cream and milk cans. Whatever else may be said in regard to this development, it can at least be claimed that it



FIELD OF CABBAGES ON THE BRANDON EXPERIMENTAL FARM
Vegetables of Almost Every Sort Produce Abundantly in Manitoba

eries and 22 cheese factories. It is rather remarkable that practically all of the latter are in the French and Mennonite settlements, while the former are well scattered over the province. In 1915, a total of 53 carloads of creamery butter was exported by Manitoba, and the production and prices were:

Product	Pounds	Price, Cents
Dairy butter.....	4,150,444	23.0
Creamery butter.....	5,839,667	29.0
Cheese.....	726,725	15.0
Milk.....	44,079,000	2.1
Sweet cream in pounds butter fat.....	496,334	32.0

makes for the development of the dairy industry in districts where there is not as yet a sufficiently solid block of dairy farmers to support a local creamery. In this way the enterprise is decidedly beneficial to the province.

Poultry.—So far poultry keeping in this province is pretty much a domestic industry. We have got pretty well past the day of conspicuous importation, and we cannot yet claim to export either eggs or poultry to any great extent. All kinds of poultry thrive in our

climate, and, with the manifest economy of poultry keeping where grain is produced so cheaply, it is safe to predict a steady growth in the industry.

Fruits and Vegetables.—Up to the present tree fruit growing is in the pioneer stage. In no other sphere of plant production did old Dame Nature so positively assert to the early settlers that the Manitoba climate was unlike the climate "down east". Thousands of trees from eastern nurseries, of varieties quite hardy in Ontario, have gone to

experimentation; and every farmer, by planting suitable varieties, can easily raise all of these fruits needed for his home use. The most trying factor, perhaps, is a shortage of summer rainfall.

Vegetables of almost all sorts thrive wonderfully and yield abundantly.

THE AGRICULTURE OF THE FUTURE

There is always danger in prophecies; yet there seem to be a few forecasts that may be made with com-



SUCCESSFUL PRODUCTION OF APPLES BY A. P. STEVENSON, MORDEN, MANITOBA

the brush pile. Forty below zero demands varieties with a new kind of iron in their blood. But those kinds are coming, and already small apple and plum orchards here and there are coming into bearing, the most conspicuous success, of course, being that attained by Mr. A. P. Stevenson, of Morden, who annually gathers apples, plums and cherries of scores of varieties.

Success with small fruits is quite a different matter. Currants, raspberries, strawberries and gooseberries are all beyond the stage of

parative safety. I think the safest of all these is that as the years go by mixed farming will come into more general practice. This movement is not waiting for converts, because practically everyone is converted to the greater economy and efficiency of this method of farming. It is mainly waiting for the day when the man on the land will be able to shrink the percentage of his capital to be locked up in land, and increase the percentage that he can invest in live stock and equipment needed in connection with the keeping of

animals. The spread of weeds and the waste of humus, which inevitably accompany continuous cropping, are making converts to a change of methods quicker and more surely than any other process could possibly accomplish it. Silos, dairy herds, sheep, hogs, and chickens will save the situation and enable the boys and girls to attend the agricultural college even after the mortgage company has foreclosed and ended the chapter of continuous wheat cropping and straw burning.

Only in a few cases will the mortgage company ever have a chance to foreclose. In most cases the change to a better balanced kind of farming is proceeding as an evolution, and will need no revolution. Better homes, better fences, better shelter for live stock and a better class of live stock kept, better treatment of the land in the way of return of manure and crop rotation,—these are some of the things now on the agricultural landscape.

AGRICULTURAL ORGANIZATIONS

An account of Manitoba agriculture would scarcely be complete without some reference to those organized agencies that have to do with its promotion.

The Manitoba Agricultural College, equipped at a cost of four million dollars, is located about three or four miles south of Winnipeg, on the banks of the historic Red River. The governing body is a board of ten directors, four elected by the directors of the Live Stock and Grain Growers' Associations and five by Order-in-Council. The Minister of Agriculture is *ex-officio* a member of the board. The enrolment has grown since the opening in 1906 (at a site previously

occupied) from 83 students to 350 students in the regular winter courses in agriculture and home economics.

Manitoba has its full quota of agricultural associations, most of them incorporated by special act of the Legislature and financially aided through the Department of Agriculture. Among these may be named the four live stock associations—Horse Breeders, Cattle Breeders, Sheep Breeders, and Swine Breeders. Also there are poultry and horticultural associations at different points, and a provincial dairy association.

Among the agricultural exhibitions of Manitoba, the summer show at Brandon is practically, and the winter show there is actually, provincial in character. Most of the exhibitions in the province, however, are held under the auspices of agricultural societies, of which, according to the figures for 1915, sixty-eight are in operation.

Then there are 102 Home Economics societies organized, mainly among the farm women, with a total membership of 3,730; and there are Boys' and Girls' clubs with about 12,000 members.

Very important and very influential, though not drawing any Government aid, is the Manitoba Grain Growers' Association, which convenes annually the largest single agricultural gathering that is held within the province. The membership of this association numbers 9,000.

These are among the agencies that are seeking to give direction and impetus to our agricultural efforts and enable the farmers of Manitoba to avail themselves of our undoubtedly vast agricultural resources.

CO-OPERATIVE MARKETING OF WOOL

PRINCE EDWARD ISLAND

BY W. R. REEK, B.S.A., DIRECTOR OF AGRICULTURAL INSTRUCTION

CO-OPERATIVE grading and marketing of wool were undertaken for the first time last year; 5,500 lb. were gathered from about 50 farmers, and sold very satisfactorily.

The season was late when the work was undertaken, consequently no organization was attempted. Immediately the busy time was over societies, having as their aim the co-operative selling of wool and lambs and community breeding, were formed in the western part of the Island. In other parts farmers' institutes and live stock associations took up the work. Wherever a live association was located, this became part of their work, thus avoiding over organization. The aim is to combine all local societies under the Sheep Breeders' Association, thus placing all the work upon the producers. During the short courses held in the winter, Mr. J. D. Thomson, representing the Federal Live Stock Branch, gave a number of demonstrations in boxing fleeces, and pointed out how wool might be increased in value by proper care during the winter months.

The Live Stock Branch, Dominion Department of Agriculture, agreed to do the grading, as in the previous year. Stations for receiving wool were opened at Summerside and Charlottetown. Probably the greatest obstacle to overcome is the time the farmers have to wait for their payment; previously, they had sold their wool straight to the merchants and received the cash. However this, if it militates too severely, will be overcome next year; one of the bankers has agreed to assist the associations.

Probably the most noticeable effects are the improvement in the methods of handling, not only in the wool coming to the grading station, but also in that sold in the ordinary way. The greater care in wintering and the impetus to co-operative selling and the banding together for community breeding. Many farmers realized that the fleeces were very light and the cause invariably was traced to poor feeding and the use of inferior rams. Already the demand for rams is keen, and doubtless many necessarily will be purchased on the mainland.

THE FOLLOWING IS THE STATEMENT OF WOOL HANDLED.

	Weight Lb.	No. of Fleeces	Av. Wt. per Fleece	Price per lb.
Medium Clothing.....	298	59	5.05	43c.
Medium Combing.....	1835	308	5.95	42c.
Low medium Combing.....	3181	551	5.77	41c.
Coarse.....	22,304 $\frac{3}{4}$	3314	6.73	38.5c.
Black and Grey.....	241 $\frac{1}{2}$	137	6.52	30c.
Rejects.....	254	42	6.04	25c.
Locks and Pieces.....	22			25c.
Tags.....	166 $\frac{1}{2}$			10c.
Total.....	28302 $\frac{3}{4}$	4411		

The total revenue from the sale was \$10,949.47.

Three hundred and sixty-nine farmers co-operated. The out-

standing advantage obtained for the forwarding of the work is that wool came in from every section of the Island.

NOVA SCOTIA

BY M. CUMMING, B.A., B.S.A., SECRETARY FOR AGRICULTURE

THE co-operative selling of wool was undertaken in two counties of Nova Scotia during the present year, i.e., Antigonish and Guysboro, in both of which counties the Department of Agriculture has District Representatives who organize the work. In the county of Guysboro merely a beginning was made, the total sale amounting to a little less than 2,000 lb. In the county of Antigonish wool was sold co-operatively last year, and this was the second year. The wool from both counties was marketed jointly and amounted to 17,388 lb. The price paid the co-operators was

44 cents to 40 cents according to the quality of the fleece. The average price received was $41\frac{1}{8}$ cents per lb. including black fleeces, tags and a few reject fleeces. The expenses in connection with the sale, insurance, packing and loading was slightly over $\frac{1}{2}$ cent per lb. This included 100 wool sacks which were bought outright, and which may be had by members next year for bringing in their wool.

The county representatives who took charge of this work in Nova Scotia were Dr. Hugh MacPherson, Antigonish, and A. B. MacDonald, Guysboro.

QUEBEC

THE Wool Growers' and Sheep Breeders' Associations in the province of Quebec have again successfully graded and marketed their wool clip. Since their organization these associations have extended the scope of their work so that now practically every phase of the sheep industry receives attention at their hands. Assistance in the organization and directing of these associations through Mr. A. A. MacMillan and the college demonstrators has been made an important feature in the extension work of Macdonald College Animal Husbandry Department.

providing a new market for pure-bred breeders. The local sales policy will be extended, so that the requirements of all members will be met this fall.

EDUCATIONAL WORK

A large number of lectures and demonstrations were given during the year. Talks on the preparation of wool for market, demonstrations in the proper methods of shearing, rolling and tying of fleeces and the docking and castrating of lambs were given in sections that were not touched last year, the local demonstrators besides arranging for meetings and demonstrations, gave much personal assistance to members in the various associations. French speakers were provided in a number of cases by the Federal Live Stock Branch. The grading of the wool was performed by expert wool graders supplied by the Live Stock Branch.

The following tables give a complete statement of the grading for each association.

FLOCK IMPROVEMENT EFFECTED
THROUGH LOCAL SHEEP SALES

In the fall of 1915 four local sheep sales were held at which ninety-eight head of selected breeding stock including individuals, both male and female, of a number of breeds were sold. These sales afforded a larger opportunity for local selection in purchasing, besides

TABLE SHOWING NUMBER OF POUNDS IN EACH GRADE AND TOTAL WEIGHT FOR EACH ASSOCIATION

ASSOCIATION	Medium Clothing	Fine Medium Combing	Medium Combing	Low Medium Combing	Coarse Combing	Black and Grey	Rejections	Tags	Total
Pontiac	150		22382	20195	5454	556	2742½	86	51564½
Compton	244½	684	13536	8172	665½	52	1111	6½	24471½
Richmond	32	258	11003½	5353½	81	271½	554½	12	17567
Sherbrooke	189	206	13010	2668	8	158	531	115	16885
District of Bedford	319	38½	5630	7031	2893½	164	514½	81	16621½
Stanstead	436	142½	8097¾	4438	682	69	375	11	14252
District of Beauharnois	365½		2232	5227	3402		2124		13350½
Argenteuil			5276	4614	397	404	500		11191
Megantic			3025	791		70	51		3937
Total	1736	1328¾	84191½	58589½	13583	1744½	8503½	261½	169840
Percent of total	1.1	9	49.4	34.5	8.1	1.1	5		

TABLE SHOWING NUMBER OF MEMBERS AND FLEECES, AVERAGE WEIGHT AND PRICE PER FLEECE AND AVERAGE SELLING PRICE PER POUND

ASSOCIATION	No. of Members	No. of Fleeces	Average Weight per Fleece	Average Price per Fleece	Average Price per Pound
			Pounds		
Pontiac	488	7216	7 02	3 04	42 8
Compton	282	3489	7 06	3 00	42 4
Richmond	167	2364	7 43	3 10	41 7
Sherbrooke	133	2238	7 53	3 19	42 3
District of Bedford	153	2226	7 42	3 08	41 5
Stanstead	125	1965	7 22	3 06	42 3
District of Beauharnois	113	1545	8 79	3 62	41 1
Argenteuil	107	1481	7 75	3 10	40 0
Megantic	49	486	8 1	3 45	42 5
	1617	23010	7 59	\$3 18	41 8

One new association was organized in Megantic County. All the other associations show a marked increase in membership and total output of wool. Six hundred and forty-seven new members have been added since last year, and the total output of wool increased by 65,647 lb., making a total this year of 169,839 lb., with a total value of \$71,092.70. Medium combing, fine medium combing and medium combing grades sold at 43 cents a pound; low medium combing at 42 cents; coarse combing at 41 cents, black and grey and rejections at 38 cents. Fifty-one per cent of the wool sold for 43 cents a pound, while the average price for all grades including rejections was 41.8 cents a pound. The foregoing prices were all F.O.B. at shipping points.

The wool throughout was put up in excellent shape for market and was considered one of the choicest

lots of Canadian wool offered for sale this year. Local prices for ungraded wool throughout the province ranged between 31 and 35 cents a pound, so that grading and co-operative sale netted members a gain of seven to twelve cents a pound, or twenty to forty per cent advance.

The associations are operated on a purely co-operative basis. The membership fees are based on the amount of business that each member does with the association. Four cents a fleece has been found sufficient to cover all expenses, such as postage, printing, wool sacks, paper, twine, labour, etc. The working principle throughout has been the production of a high class marketable product, the application of proper methods in the preparation of this product for market, and its sale at top prices.



PHOTO OF \$83,867.43 WORTH OF WOOL SOLD CO-OPERATIVELY BY THE ALBERTA SHEEP BREEDERS' ASSOCIATION

SASKATCHEWAN

THE Co-operative Organization Branch of the Saskatchewan Department of Agriculture, which for the past three years has acted as a marketing agency for Saskatchewan wool producers, disposed of this season's clip, for an average price over all grades of 32.5 cents per pound.

Approximately 180,000 pounds, being the product from 487 association members, is involved, and the wool was all graded by expert graders, provided by the Dominion Live Stock Branch. Eighty-five per cent of the wool was placed in the straight domestic grades, and for

this an average price of 33½ cents per lb. was realized. Seven and one-half per cent graded Rejects, and was sold for 24 cents. Four per cent graded Range and the average price on this was 31 cents, while the tags, locks and pieces, and greys and blacks, which made up the balance of three and one-half per cent, brought an average price of 18 cents per pound. It is estimated that the cost of handling the wool will be in the neighbourhood of 1 cent per lb., and producers will realize accordingly. The following is a summarized statement of the wool sold:

	Pounds	Price per lb.
Fine Combing.	6623	33
Fine Clothing	10896	29
Fine Medium Combing, Firsts	11873	36
Fine Medium Clothing, Firsts	3606	34
Fine Medium Combing, Seconds	21093	34
Fine Medium Clothing, Seconds	8080	32
Medium Combing, Firsts	20729	37
Medium Clothing, Firsts	1636	34
Medium Combing, Seconds	33160	34
Medium Clothing, Seconds	4088	31
Low Medium Combing	15375	34
Low Medium Clothing		
Coarse	35741	32
Lustre	10335	31
Average price for straight grades, 33.5		
Rejects	14160	24
Grey and Black	1519	28
Locks and Pieces	914	24
Tags	2758	11
Range	5363	31
Average price for wool, 32.3		
Mohair	145	20
Pelts	267	11

ALBERTA

A tabulated statement of wool sold by the Alberta Sheep-breeders' Association, Calgary, on August 4th, 1916, or 335 members of the association shows that 42,489 fleeces were disposed of, represented in 280,515 lb. of wool, for \$83,867.43, an average of 29 90 cents per lb. The prices obtained for each grade were as follows:

Fine combing	28½c.
Fine clothing	18½
Fine Medium, combing, firsts	33½

Fine Medium, clothing, firsts	27½
Fine Medium, combing, seconds	29
Fine Medium, clothing, seconds	27½
Medium, combing, firsts	35
Medium, clothing, firsts	28½
Medium, combing, seconds	31
Medium, clothing, seconds	28½
Low Medium, combing	30½
Low Medium, clothing	30½
Coarse	30
Lustre	30
Rejects	27
Grey and black	26
Locks and pieces	22
Tags	12
Dead wool	15

PRINCE EDWARD ISLAND

WOMEN'S INSTITUTE CONVENTION

THE Women's Institutes of Prince Edward Island held their annual convention at the Prince of Wales College, Charlottetown, on July 27th and 28th. The thirty-five institutes were well represented by delegates and members, and the reports of the secretaries indicated that a successful year's work had been accomplished, especially along the lines of school improvement and patriotic work.

The women's institutes are becoming an important factor in uniting home and school, and in the districts where an institute is organized there has been an increased interest in the sanitary conditions of the schools. Patriotic work in its different phases has been taken up by all the institutes and the women are working with a zeal that is difficult to surpass. In some districts this work is done through co-operation with other local organizations so that while the institutes are doing their full share it is not included in the institute yearly report. In addition to the amounts of money voted to the various funds, the institutes send contributions of clothing, socks, food supplies, etc., to our soldiers, and it is, therefore, almost impossible to estimate the total amount of relief work done by any of the branches. A fair idea can be gathered of what has been done by some of the institutes in the statement that in materials and cash Clifton has contributed \$250.32;

Montague, \$769.75; Bonshaw, \$269.80, and Sterling, \$339.40.

The outstanding feature in connection with the different branches of work that the institutes undertake is the co-operation and enthusiasm shown by the members, all of which is tending in a large measure to improve the social life of the communities and to bring the women into closer touch with one another in their great work for "Home and Country."

Important features of the meetings were the addresses of Miss Guest, Prof. McCready, and Hon. W. A. Pierce, U.S. Consul. Miss Guest impressed upon her audience the splendid work that is being accomplished in Canada through the influence of the women's institutes, and brought before the members the importance of realizing the great opportunities and possibilities which are before them in their work.

In an illustrated lecture, Prof. S.B. McCready dealt with the conditions of the rural schools and by comparison explained how, with co-operation in the districts, improvements could be worked out. He urged the institutes to continue their work in co-operation with the schools and to agitate for the necessary improvements.

Hon. Mr. Pierce in his lecture gave a graphic description of the Southern States, and the life there, closing his address with several readings from the Southern poets.

QUEBEC

AGRICULTURAL SCHOOL MUSEUMS

BY JEAN-CHARLES MAGNAN, SUPERINTENDENT OF SCHOOL GARDENS

THE establishment of agricultural school museums in rural schools has been recommended for some years by the Superintendent of Education as a means to develop class-room work in agriculture. A vigorous campaign in favour of this organization was started this spring by the Quebec Department of Agriculture. As a result of this campaign, several museums were established in various teaching institutions, particularly the Academy of Saint-Casimir, directed by the Brothers of Christian education, the domestic science school of Neuville, several high schools and academies, and I might say most of our domestic science schools.

This school museum includes the following articles and samples: collections of seeds, economic plants (mounted), weeds of various sorts, soils, charts representing varieties of fruit and vegetables, trees, live stock, etc. There is also a sample of comb and extracted honey, small miniatures representing live stock and various agricultural implements. Some museums also have an herbarium, some acids, insecticides, fungicides, a small model of barn and a small silo. Other museums also have collections of agricultural publications, catalogues, etc.

All this material, which is not very expensive, is placed in a wooden cupboard, with glazed front; the samples are laid on shelves inside. This school museum is placed in a prominent place in one of the class rooms most of the articles and samples are labelled so that the pupils may learn the name of each

soil, plant, seed, fruit, vegetable, etc.

The agricultural school museum at the Academy of St. Casimir de Portneuf is placed in a small wooden cupboard, four feet high by three and a half feet wide, with four shelves on which are laid the following samples:—

“Small models of live stock, coloured illustration of the anatomy of the horse, cuts representing various vegetables and fruit as well as some fruit trees, small herbarium, agricultural publications and reviews, the *Journal of Agriculture*, the *Bulletin de la Ferme L'Ecole Rurale*, *Better Fruit*, *Canadian Horticulturist*, *Farmer's Advocate*, *Campbell's Scientific Farmer*, *Primary Education* and others, miniatures of agricultural implements, samples of seed, cereals, leguminous plants, grasses, etc. We have also an apparatus to bleed chickens, samples of comb and extracted honey, agricultural catalogues, some earthen drains, a miniature silo, wax foundation for hive frames, a small hive with movable frames, a collection of vegetable seeds and others mounted on a card, collection of maxillaries to study the age of the horse, model pails and cans used for milking and in the handling of milk, different samples of soils, pruning shears, a pruning knife grafting knives, wax, some insects, acids, the two principal fungicides, insecticides, and several other articles utilized in the agricultural education of the pupils.”

This school museum was established with the help of the pupils and of the Brothers who manage the school of St. Casimir.

This school museum is very useful

for class room work or practical work in the teaching of agriculture. With the help of the samples, the teaching may be made pleasant and profitable. By so doing, we are following the pedagogic principle which requires that the teaching be given in a concrete manner so as to reach the imagination and the intelligence of the pupil. This teaching has given the best results at St. Casimir; the pupils understand the agricultural profession and have respect for it. They take great interest in their garden plots, even during the holidays; they have also, at least a great many of them, a home garden, which they cultivate themselves, and where they grow vegetables and flowers, which are shown at the school-fair held every autumn. Lastly, the pupils have formed themselves into an association, which is

called the Young Gardeners' Club of St. Casimir.

The agricultural school museum is one of the most efficient means through which the teacher may create a liking for agriculture and make its teaching attractive and interesting.

Every school should have a museum and the school boards should see to it that their schools are equipped with museums proportionate to the standing and to the age of the pupils.

The establishment of the school museum need not be very expensive. It can easily be made by the teacher, with the help of the pupils. Once established, the museum may serve for the instruction of all the generations of pupils who pass through the school.

THE BACON INDUSTRY

BY E. BELANGER, JOURNAL D'AGRICULTURE

IN 1912, the Quebec Department of Agriculture, desiring to help the farmers to utilize the by-products of their creameries and cheese-factories, started a campaign for the increase of bacon hog production for the local as well as for the export trade. It was thought that the time was ripe for this move, owing to the great development of the dairying industry.

In October, 1912, a Danish expert, Mr. A. Hansen, ex-student of a Danish Agricultural School and director for twenty years of one of the main co-operative slaughter-houses of Denmark, was secured for this work. After receiving his first instructions from the Department of Agriculture, Mr. Hansen at once went to the Oka Agricultural Institute, where he supervised the construction of the necessary buildings for the preparation of bacon and cured meats. Similar buildings were erected at the School of Agri-

culture of Ste.-Anne de la Pocatière. Lectures on the breeding and feeding of pigs were also given before the pupils of Macdonald College. Mr. Hansen at once called attention to the fact that the Canadian bacon contained too much salt to compare favourably with the bacon manufactured in other countries. But after having examined several piggeries, he stated that ten years hence, if we continue to improve our feeding and breeding methods, the bacon industry might reach a great development in our province and yield splendid profits to the farmers.

Mr. Hansen is an advocate of co-operation. In Denmark, seventy-five per cent of the bacon is sold through co-operative associations. The organization of such co-operatives in Canada would, he thinks, give the best of results.

The courses and practical demonstrations which have been given alternately at Ste-Anne de la Pocatière

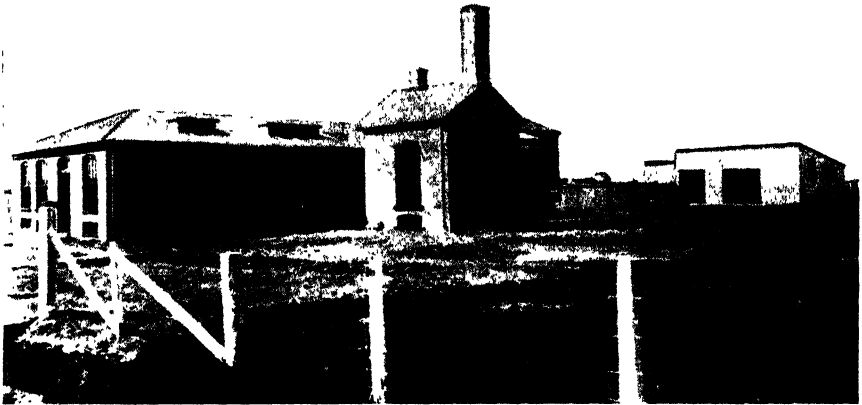
and Oka, since Mr. Hansen arrived in Canada, have been very useful for the pupils of these two schools. Some of them have specialized in the curing of bacon; others studied only the breeding and the feeding of the hog in view of bacon production. The teaching includes: the selection of a bacon type of hog, various methods of feeding, slaughtering, dressing, salting, curing, marketing, advantages offered by the industry, co-operative associations, etc.

The pure-bred or grade Yorkshire is the best type; excellent prices being obtained for live hogs varying in weight between 175 and 225 lb.

the locality. Only a small number of farmers were in favour of the undertaking in spite of the forceful way in which the advantages of this establishment were presented. Realizing the farmers of the district were not ready for such a move, the slaughter-house school of St. Valier was built by the Department exclusively.

The main building, 50 x 32 feet, includes a slaughter-room, a refrigerator and a curing-room, an ice-house, a working-room and a counter for the sale of meats. Annexed to the main building are the curing-house and a shed.

This slaughter-house was started



THE ST VALIER SCHOOL ABATTOIR, BELLECHASSE, QUE.

There is no margin between the cost of production and the selling price on a pound of gain after a weight of 225 lb. is reached.

A part of the bacon manufactured in both of these institutions is consumed by the pupils, the rest is sold outside.

THE SLAUGHTER-HOUSE SCHOOL OF ST. VALIER

On the 20th of September, 1913, a meeting of the farmers of St. Valier, county of Bellechasse, was called to discuss the establishment of a co-operative slaughter-house in

on the 24th of November, 1914. A fair part of the products were sold through the Quebec Cheesemakers' Co-operative Association in Montreal and Quebec, and the rest was shipped to the Quebec market.

In the spring of 1915, the Department decided to have the slaughter-house enlarged and to put in artificial refrigeration. The manufacturing processes were thus interrupted for three months. The capacity of the slaughter-house, which hitherto had been 15 pigs per week only, was increased to 50 or 60 pigs.

A larger room was made for ærating meats before refrigeration.

The curing house was enlarged and a system of trucks on steel rails was installed.

At the beginning of August, work was again started at the slaughterhouse. Fine samples of bacon, pigs, etc., were exhibited at the Quebec provincial exhibition and at the Sherbrooke fair.

The management of the slaughterhouse finds some difficulty in getting suitable animals. However, its work is educational and it endeavours to present upon the local market the best quality of meat, packed in an attractive manner.

Last year, prices paid for slaughtered pigs ranged between 11 and 12½ cents per pound. The price for bacon was on an average, 19 cents. During the year 1914-15, some students availed themselves of the advantages offered them by the Department and followed the practical courses that are given.

The record kept in the slaughterhouse includes all the advice given daily to the farmers who ask for information with regard to the breeding and feeding of sheep, pigs, cows and fowl. In the spring of 1916, the management of the slaughterhouse was entrusted to the directors of the Quebec Cheesemakers' Co-operative Association. It is the intention of this house to continue to make this institution of real service to the agricultural community of the district. We are glad to say that this purpose has been reached. Sheep, pigs, cows and fowl are graded there and slaughtered by experts under the direction of Mr. Hansen, then prepared with care and shipped to the markets of Montreal and Quebec. The farmers thus learn to slaughter and prepare their animals for the market, so that they may obtain the best prices.

The St. Valier slaughter house school helps the farmers to make more money out of animals which they sell and teaches the best methods of breeding and feeding. A large number of farmers are beginning to

realize the advantages of the bacon hog production and if the large curing houses of Montreal have had to get their pigs from other provinces in the past, it is believed that in a short time, our pig-breeding industry, which is an advisable adjunct of the dairying industry, will become general throughout the province, supply the local consumption and have a sufficient surplus for export, so that the province of Quebec will have the largest share in the revenue that Canada derives from this great industry.

FEEDING CONTEST FOR BOYS

The feeding contests, which were opened this spring to the boys of twenty-seven counties of the province by the Quebec Department of Agriculture, will also help in getting a large number of farmers interested in the system of breeding the bacon hog.

CO-OPERATIVE SLAUGHTER HOUSE OF PRINCEVILLE

A co-operative slaughter house dealing in the bacon hog trade and the preparation of cured meats was organized last year in the parish of Princeville, Arthabaska county; the sum of \$30,000 was subscribed as a capital by the farmers. The first operations of this slaughter house were encouraging.

An interesting bulletin on bacon hog feeding and breeding for distribution to the farmers was prepared by the Danish expert attached to the Department. Circulars and articles for the papers were also prepared and lectures were given. Lessons were also given to a number of teaching institutions on the curing of meats.

This is as brief an account as possible of the measures taken by the Quebec Department of Agriculture during the last few years, to develop the breeding of pigs and the production of bacon in the province.

THE TEACHING OF AGRICULTURE AT FAIRS AND EXHIBITIONS

BY H. NAGANT, DIRECTOR OF THE JOURNAL D'AGRICULTURE

DURING the last few years, the Hon. J. Ed. Caron, Minister of Agriculture for the province of Quebec, has endeavoured to make as much use as possible of the opportunity afforded by the great exhibitions and particularly by the provincial exhibition, held every year at Quebec, to let the visitors know of our agricultural progress, to spread agricultural knowledge by object lessons and practical demonstrations in almost all the branches of farm management, and to encourage the development of our various agricultural and domestic industries. For this purpose, the Minister has secured the services of the experts of various branches of the Department, as well as of the numerous institutions under its control and required them to prepare a series of interesting and instructive exhibits. The programme carried out was as follows:—

QUEBEC PROVINCIAL FAIR

August 23rd to September 2nd, 1916

Fruit Culture.—The visiting public takes a big interest in fruit culture but often lacks practical knowledge of the culture and production of fruit, the packing, the selection of varieties and the care required by well kept orchards. In order to fill this deficiency, the provincial Department of Agriculture again reserved this year an important part of the Palace of Industry for an exhibit on fruit culture. This exhibit included all the varieties of apples, plums, pears, etc., that are best adapted to the province. The name, the variety, date of ripening, market value, quality and hardness of each species, were marked on a label attached to each sample.

Illustrated diagrams demonstrated the methods to be followed in operations that are practised on fruit

trees; grafting, pruning, budding, etc. There was also a complete set of tools and implements necessary for tree surgery and spraying; two lecturers were on hand to show the use of the various insecticides and fungicides, to explain the operating of the apparatus and the use of tools in fruit culture and to answer all questions, particularly as regards the grading and packing of the fruit.

Bee-keeping.—The bee-keeping exhibit was in a special building this year. Talks and demonstrations on this interesting industry were given each day by experts. All the modern bee-keeping apparatus was shown.

Poultry.—The exhibit and demonstrations on this important industry of the farm covered the following:

- (1) Incubating and hatching chicks every day.
- (2) Brooding chicks.
- (3) Spring chickens raised by good farmers.
- (4) Pens of hens and poultry house fitted as they should be for profit.
- (5) Preparation of mash with rape, vegetables, etc., to show how the fowls may be kept economically while they are supplied with the most suitable food.
- (6) Fattening chickens.
- (7) Slaughtering, two demonstrations per day.
- (8) Castration, two demonstrations per day.
- (9) Miniature poultry house for demonstrations and complete poultry keeping outfit, fattening crates, trap-nests, etc.
- (10) Each department was in charge of an expert instructor, who gave the necessary information to the public.
- (11) Talks on poultry every day.
- (12) Distribution of bulletins on poultry keeping, on request.

The St.-Valier Slaughter School-House, Que.—An exhibit of samples of bacon, cured meats, etc., was shown again this year by this establishment, which is under the control of the Quebec Government.

A professor was on hand to give all information that may be required on this important industry.

School Gardens.—This interesting work which has taken a great development in the province of Quebec was represented at the exhibition by the following exhibits:

- (1) Crops of all sorts from the best kept school gardens.
- (2) Agricultural school museum for class teaching.
- (3) Model school garden, in miniature, with plan of school.
- (4) Photographs of forty of the best school gardens of the province, and other models and charts for elementary agricultural teaching.

Domestic Science Schools at the Exhibition.—About twenty-five domestic science schools took part, this year, at the Quebec provincial exhibition. The best part of the Fine Arts building was reserved for them. A specified space was reserved to each school. At the top of each space, the name of the school was written in large letters and the products of the school presented in as artistic a manner as possible.

The work of the three courses (academic, model and elementary) was shown and judged separately; in this manner the age and the grade of pupils was taken into consideration.

The various exhibits (underwear, clothes, woollens, tissues, culinary products, garden products, etc.) were presented and classified in a systematic manner.

The following regulations governed this exhibit:

- (1) Only the domestic science schools of the province of Quebec are entitled to take part in this competition.
- (2) Each article shown shall be the work of a pupil of a domestic science school.
- (3) For every article shown, the judges must take into consideration not so much the shape and the drawings as the manner in which the work is done.
- (4) The name, the age of the exhibitor and the class to which she belongs must be given in every case.

It should be stated, however, that the domestic science schools are not attracted to the exhibitions by the hope of awards, but rather because they want to show to the people the practical results of domestic science teaching in our convents.

The domestic science school programme contained this year a happy departure, which was greatly appreciated by the women attending the fairs. Mademoiselle Jeanne Anctil, director of the Montreal domestic science school, gave daily, from 2 to 4 p.m., in the Fine Arts building, lectures on the preparation of soups, the cooking of fresh and dry vegetables, the cooking of meats and fish, the dishes for sick and convalescent persons, as well as side dishes and deserts. In the forenoon, Mademoiselle Lucille Boéchat, of the same school, lectured on the care and feeding of infants.

Women's Clubs at the Exhibition.—The women's clubs of the province had exhibits of their work in the poultry house, the apiary, and in the vegetable garden, as well as articles of clothing and fine arts, in order to show that the teaching of domestic science in our senior schools for girls has good effects in practical life.

The exhibit of the women's clubs was placed in the Fine Arts building, next to the domestic science schools' exhibit; there were posters and charts explaining to the visitors the object and operation of these new clubs and the manner in which they are being advertised to the great benefit of agriculture.

The women's clubs of Chicoutimi, Roberval, Champlain, St-Agapit, Beauceville and Plessisville took a large part in this exhibit. Instructive demonstrations were given every afternoon during exhibition week in the sections of bee-keeping and poultry at the building of the Experimental Union, near the Fine Arts' building. The work of women's clubs was explained, and

agricultural bulletins specially interesting for ladies distributed.

The women's clubs are a new institution and deserve to attract the attention of progressive persons, who desire to help the progress of our province by taking part in the back-to-the-farm movement.

Quebec Cheesemakers' Co-Operative Society.—This Society presented maple syrup and maple sugar, honey, eggs, cured meats and a few other agricultural products, which it handles.

A large number of copies of its bulletin, very useful for the farmers who desire to know the market conditions, were distributed.

Some other Exhibits of the Department.—Special exhibits arranged by the various institutions under the control of the Department were presented. For instance, there were apples from the orchards of the various co-operative associations and demonstration orchards, the products of vegetable gardens, honey, maple syrup and maple sugar from the maple sugar schools and the co-operative associations of pure maple products.

SHERBROOKE EXHIBITION

The Sherbrooke exhibition was held from September 4th to September 11th, 1916.

The same programme was adopted for the Sherbrooke exhibition, with the exception of the domestic science schools and women's clubs exhibits.

THREE RIVERS EXHIBITION

The Three Rivers Exhibition was held from September 21st to September 28th, 1916.

A part of the poultry house recently built on these grounds was put at the disposal of the Quebec Department of Agriculture by the Three Rivers school board.

Poultry. Incubation and artificial brooding, how to work an incubator, time required for incubation, care to be given to the chicks in order to avoid diarrhoea: (2) castration; (3) feeding of laying hens; (4) fattening; (5) slaughtering; (6) demonstrations on the construction of poultry houses suitable for the province of Quebec, were illustrated and demonstrated.

PRODUCTION OF ROOT SEED

BY F. N. SAVOIE, DEPARTMENT OF AGRICULTURE

ROOT seed has been produced during the last few years in a small way in the province of Quebec. Last year, various kinds of roots and their chief varieties were tried by a few farmers and by the two schools of Agriculture of Ste-Anne de la Pocatière and Oka. The results were most satisfactory. At Ste-Anne, four varieties of beets, one of swedes and two of carrots, were tried by Monsieur l'Abbé Bois, professor in fodder crops. The seeds obtained were tried this year on plots and compared with seeds of other varieties, coming from Vil-morin. Up to the present time, a comparison between the two crops is greatly in favour of the home-

grown seed.

At Oka the same experiments have been made with identical results. The production of root seed is being urged by our lecturers, who also teach the best methods.

Several of our District Representatives have succeeded in getting a number of farmers in their districts to grow swedes, carrots and beet seed. The production will be increased this year, judging from appearances, and I have no doubt that before long the province will not only produce a sufficient quantity of root seed for its own use, but will also be able to export some to other provinces and other countries.

THE ANNEX TO THE OKA AGRICULTURAL INSTITUTE

BY BRO. JEAN DE LA CROIX, DIRECTOR

THE annex to the Oka Agricultural Institute, a photo of which is published herewith, was completed for the opening of the courses in September, 1915. Its dimensions are 160 feet long by 63 feet wide. It is used chiefly as a residence for the students, who number about 120.

This is a four-storey building, not including a large basement with

On the second floor are the studying room, physics and chemistry classrooms, the library, the offices of the director and of the secretary.

On the third and fourth floors are the large and small dormitories, accommodating together about one hundred beds with bathrooms and showers. There are also twenty-four rooms for students of advanced classes. The chapel is on the fourth



THE ANNEX TO THE OKA AGRICULTURAL INSTITUTE

cement floors, well lighted and containing the lockers where the students leave their working clothes. On the first floor is the visiting room, the class rooms for zootechny and zoology, field crops and recreation room. The latter is a large room, splendidly lighted, in which are several gymnastic apparatus.

storey.

The building is lighted by electricity. It is heated by means of two hot-water furnaces.

The older building, known as the "old school," is occupied by the various laboratories of chemistry, mineralogy, zoology, anatomy and physiology.

ROOT SEED PRODUCTION AT MACDONALD COLLEGE

BY P. A. BOVING, ASSISTANT PROFESSOR OF AGRONOMY, UNIVERSITY OF BRITISH COLUMBIA,
VANCOUVER, B.C., LATE OF MACDONALD COLLEGE

DURING a number of years mangel, swede, turnip, and carrot seed have been produced at Macdonald College. The efforts have been not only to prove conclusively that root seed can be satisfactorily produced in the province of Quebec, but also have been toward the isolation of suitable new strains and the determination of the best method of seed growing.

Without going into all the details in favour of home-produced seed it is

Before starting seed growing at all, it is necessary to have good foundation stock. Our variety tests, including 60 mangel, 35 swede, 25 turnip, and 20 carrot varieties have provided us with good material for selection. At the same time these experiments have emphatically demonstrated the inferiority of the greater part of the root seed offered on the Canadian market, and have clearly shown the necessity of improvement therein.



No. 1, SELECTION OF MANGELS FOR SEED AT MACDONALD COLLEGE

advisable to emphasize the point that domestic seed of strains descendant of good mother plants, isolated under Canadian conditions, will probably show a greater development of the desirable characters for these same conditions, than would imported seed. In other words, really satisfactory seed can be produced only under conditions the same or at least similar to those under which the crop is to be grown.

To produce a new strain all that is needed is one good mother root, planted at a sufficient distance from mother seed roots to obviate the danger of cross-fertilization. That is a simple matter, merely requiring care; the real difficulty lies in obtaining a new strain that shall, not only in one respect, but as a whole, outclass the parent stock from which it was selected.

The aim in the breeding work at

Macdonald College has been to produce strains characteristic for their trueness to type, smoothness, ease of harvesting, high yield per acre of dry matter, and good keeping quality. To isolate such strains each year about 200 roots are selected in the field from the very best varieties. These are stored and severely judged in the spring, about 100 being chosen and planted in isolating tents to ensure self fertilization. The seed from each of these one hundred roots is harvested separately and weighed. Those mothers which fail to pro-

duce to actual yield, although this character is naturally considered in extreme cases. For one reason or another, such as a poor crown, an uneven colouring, a lack of uniformity of type and general conformation, and an over-abundance of prongs, about 25 per cent more are eliminated leaving as "fit" about 50 per cent of the original number. The yields of these are taken and a selection of the best individuals is made for propagation the following year. On account of too low percentage of dry matter, which is



NO. 2, BREEDING BLOCKS OF ROOTS AT MACDONALD COLLEGE
Note Isolating Tents in the Background

duce a satisfactory amount of seed (which amount varies as to the kind and the season) are mercilessly discarded, this selection as a rule eliminating about 25 per cent of the "elite mothers" from the contest. The following year the seed from each of the remaining mothers is planted in separate plots and grown so that the results can be compared with those of certain varieties which have been selected as standards for comparison. In the field the roots are judged chiefly on outward characteristics and less attention is paid

tested after the harvest, or on account of bad keeping qualities, 10 per cent more are usually disqualified from future tests, in which the eliminatory process continues until only the best remains.

In this way 600 individual roots have been tested. We now have several strains of swedes and mangels combining a satisfactory seed yield with a high production of dry matter and good keeping quality, these strains proving, under our conditions, decidedly superior to anything obtainable on the market.

TABLE SHOWING YIELD OF SOME MANGEL AND SWEDE STRAINS OF MACDONALD COLLEGE STOCK, SELECTED IN 1911-1912.

	Relative Yield of Dry Matter	No. of Years in Test
Mangels:— Giant Yellow Intermediate (E) (Standard)	100	
Yellow Intermediate No. 1111 (M.C.)	105	3
Yellow Intermediate No. 1211 (M.C.)	110 3	3
Yellow Intermediate No. 1512 (M.C.)	109	2
Yellow intermediate No. 5312 (M.C.)	106	2
Yellow Ovoid No. 3311 (M.C.)	107	3
“ “ “ 3411 “	111	3
“ “ “ 4011 “	109	3
Swedes:— Hall's Westbury (R) Standard	100	
Purple Top Globe No. 9011 (M.C.)	114.6	3
“ “ “ “ 9111 “	114.3	3
“ “ “ “ 8112 “	109	2
“ “ “ “ 8312 “	114	2

MANURING AND CULTURAL METHODS

We cannot pass the subject of the production of root seed without touching on the important questions of manuring and of cultural methods. As regards the first of these questions, our experiments have corroborated the experience of the seed growers in other countries, that the roots require a warm, deep, well-worked soil, rich in humus and of high fertility. The seed roots make great demands upon plant food and moisture. Where stable manure is not available in sufficient quantities, commercial fertilizers make an efficient substitute. When a general "home-made" mixture is used at the rate of one-half ton per acre, it is preferable to supply the nitrogen in the form of Sulphate of Ammonia rather than as Nitrate of Soda, as the latter tends to hasten unduly the growth of the young seed stalks, making them weak and less resistant to the pressure of the wind. Liquid manure is an excellent fertilizer for seed roots; we have found in the production of mangel seed that an application of five tons has led to an increased production of as much as 250 lb. of seed per acre. On soils deficient in phosphoric acid, liquid manure should be supplemented with superphosphate or basic slag.

As regards distances of planting, we have found 30 x 30 inches to be the ideal spacing for large roots, and 24

x 24 inches correct for small roots. To obtain good results, the seed roots should be grown in a place suitably protected from exposure to the heavy winds, which are prevalent in this locality.

Naturally, care has to be exerted to prevent cross fertilization either of different varieties or of related kinds. The result of such a cross-fertilization is a multitude of types giving a crop in no way superior to



NO. 3, MACDONALD COLLEGE DEMONSTRATION PLOTS ON THE FARM OF MR. LOUIS ROCHELEAU, STANBRIDGE STATION, QUE.

the parents and usually inferior. In the propagation of the different strains considerable distance is allowed between each so as to eliminate the action of the wind and insects. For the ordinary grower it is advisable not to work with two kinds of related plants, or with more than one variety within the kinds. In that way, he will be able to keep his

strains pure and generally satisfactory

CO-OPERATIVE TESTS

Aside from the work conducted at the College we have given all possible encouragement to the farmers of the province of Quebec in the attempt to



No. 4. SUCCESSFUL CARROT SEED PRODUCTION CONDUCTED BY MR. AND MRS. PELLETIER, REPENTIGNY, QUE.

produce their own root seed. With this object in view seed roots have been sent out and foundation seed has been distributed in several counties. We are pleased to report that these local tests give good promise of a future satisfactory development of this important industry. Wherever the roots have been given a fair chance, that is, where they have been planted in a moderately fertile soil which has been kept clean and well mulched, they have developed strong flower stalks bearing an abundance of seed. In some localities the swedes have suffered from attacks of the green aphid, but where these intruders have been treated in time with tobacco extract the injury has been minimized. In other places the black aphid has occasionally appeared on the seed mangels, but in no case, to our knowledge, has this insect done any serious damage. By being sprayed twice with a solution containing 0.1 per cent of nicotine, the black aphid is even more easily controlled than the green aphid.

It would carry us too far to mention all the different growers with whom we have had the pleasure to co-operate, but a few words may be said in explanation of the accompanying illustrations.

No. 1 illustrates the selecting of mother roots at Macdonald College and No. 2 the isolation of these to prevent cross fertilization. No. 3 is a photograph of Mr. Louis Rocheleau, Stanbridge Station, Missisquoi County, and his excellent seed mangels in 1915. No. 4 is a picture of Mr. and Mrs. Pelletier, Repentigny, in their carrot seed plot. They have become interested in this work and have had exceptionally good results. In No. 5 we find Mr. J. H. M.



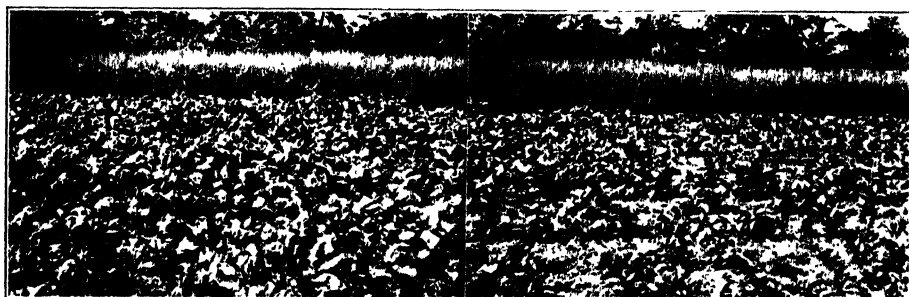
No. 5. SEED ROOTS ON MR. J. H. M. PARKER'S FARM, LENNOXVILLE, QUE.

Parker, standing behind a long row of heavily seeded roots. Mr. Parker has co-operated with us for several years. In the spring of 1915, for instance, he had a few pounds of Yellow Intermediate mangel seed, (Macdonald College stock) which was produced on his farm in 1914.

As the supply of this seed was not sufficient for the planting of the whole field it was supplemented by seed, supposedly of the same variety, obtained from a local dealer. The rate of seeding was fifteen pounds per acre in both cases, but the stands resulting from these two kinds of seed were so different that we took a photograph of both. In

seed, a difference corresponding in feed value to 2,200 pounds of oats. This is only one of the many instances where home-produced seed has proven vastly superior to commercial seed.

It would, however, be entirely wrong to put all the blame for poor seed on the Canadian seedsmen. These, in most cases, try hard to



No. 6, HOME-GROWN CANADIAN SEED

COMMERCIAL SEED

A Fine Example of the Superiority of Home-grown Canadian Seed (on the left), over Ordinary Commercial Seed (on the Right)

Figure 6, it will be noted that the home-grown seed has given a good stand of healthy vigorous plants. On the other hand the commercial seed (to the right on the picture) gave a very irregular stand of plants of poor conformation and lacking in uniformity. In the fall, the home-grown seed yielded ten tons per acre more roots than the commercial

supply their customers with the best seed available. At present such seed is all foreign grown. The fault lies fully as much with the farmers themselves, who will not or, at least, do not, produce domestic seed in quantities sufficiently large for distribution through either the seedsmen or their own organizations.

The average price paid to producers of the United States for unwashed wool during June was 28.7 cents per pound, which compares with 23.7 cents, 18.4 cents, 15.6 cents, 18.7 cents, 15.5 cents and 19.5 cents, respectively, in June of the past six years. The average weight of wool per fleece this year is about 6.92 pounds, which at 28.7 cents a pound is worth to producers \$1.99, or practically two dollars per fleece. The number of fleeces shorn in recent years in the United States has been between thirty-six and thirty-seven million yearly. The weight of wool per fleece this year, 6.92 pounds, is the heaviest ever recorded in the United States. Last year the average was 6.84 pounds, and the average for the past ten years is 6.74 pounds. The average weight per fleece reported by the U. S. census of 1910 was 6.84 pounds, and by each of the preceding censuses from 1900, to 1840, respectively, the average weights were 6.66 pounds, 5.57 pounds, 4.80 pounds, 3.52 pounds, 2.68 pounds, 2.42 pounds and 1.85 pounds. These facts are gathered from a statement in The National Provisioner, an United States publication.

ONTARIO

AN AGRICULTURAL SCHOOL FOR EASTERN ONTARIO

BY W. BERT ROADHOUSE, DEPUTY MINISTER OF AGRICULTURE

A new agricultural school is to be established through the Ontario Department of Agriculture for the purpose of serving a large proportion of Eastern Ontario. It is to be located on land which has been secured adjacent to the town of Kemptville. Plans for the buildings and for organizing the work are being undertaken at once. It is anticipated that the total capital cost will be in the neighbourhood of \$100,000, to be financed with the aid of moneys received under THE FEDERAL AGRICULTURAL INSTRUCTION ACT, an agreement to this effect having just been approved by the Minister of Agriculture at Ottawa.

"The proposed school," said the Honourable J. S. Duff, Minister of Agriculture for Ontario, in announcing the decision, "is only the natural evolution of the progressive agricultural policy of the Government. It will be recalled that the late Sir James Whitney while in opposition advocated local agricultural schools. Out of this arose the system of District Representatives which was inaugurated shortly after the Government came into office. This system at its inception was intended to be more for the teaching of agriculture to boys in schools than for the outside work. The early experience of those in charge of the system, however, demonstrated that owing to the fact that little ground work had been done in agricultural instruction among the young men before, there was little or no demand for agricultural instruction among the young men. As a consequence the District Representatives found their greatest usefulness in the field, and, in the carrying on of their

work they have also done a great deal through School Fairs, four to six weeks Winter Courses, Junior Farmers' Improvement Associations and by other means to emphasize the advantages to be gained by young men through greater agricultural education and thereby creating a demand for more along this line. Consequently we feel that the time has arrived when an agricultural school in the province will be successful and will render a real service.

PURPOSE OF THE SCHOOL

"The purpose of the school, therefore, is to make more available practical education in agriculture and domestic science at a point which will be readily accessible and involve a minimum of expense to the students. It is not proposed to duplicate anything already being done in the province unless it is to some extent the first two years of the course at the Ontario Agricultural College. Our experience in District Representative work has shown that there is a large number of young men between the ages of sixteen and twenty-five who have left school and yet who would like to take advantage of further education in their chosen vocation if it can be secured reasonably conveniently. There has also been indicated a demand for education in domestic science among the young women in the rural districts, and it is the intention of this enterprise to meet this demand as far as it is possible.

COURSES WILL BE PRACTICAL

"Although the details of the courses will be determined later in conference

with the Ontario Agricultural College officials I may say that it is our intention to make the courses as useful and practical as possible. In agriculture there will be no course longer than two years and there will also doubtless be a number of short courses. It is possible that the term will extend for only about five months in the winter season and a diploma granted at the end of two terms. While arrangements might be made to have this diploma entitle a student to admission at the Ontario Agricultural College if he desired to enter the College at the third year, it would nevertheless be the main purpose of the school to further qualify men and women for better work on their own farms and homes. The land in connection with the school, except that which may be needed for experimental purposes, will be used as a practical farming proposition, putting in use the best methods available. No doubt in this institution dairying will be the line adopted so as to render the maximum service to the community, which is so largely engaged in this industry. The course in domestic science would no doubt at the out-set at least be mainly short courses of perhaps three months' duration.

SELECTION OF SITE

"In selecting the site considerable care has been exercised. It was, of course, obvious at the out-set that an institution of this kind should be located in Eastern Ontario. Different localities were considered but the present selection was finally adopted on the recommendation of

officers of the Department who investigated the matter. Kemptville, which is a progressive town in the heart of a very thrifty agricultural section, is admirably served by railways from the north south, east and west and thereby immediately serves the counties of Dundas, Carleton, Lanark and Grenville, but it is also splendidly convenient to the majority of the counties of Eastern Ontario. The farm practically adjoins the town. It is within view of the C. P. R. Ottawa line and also fronts on the proposed Ottawa-Prescott highway. While there are splendid transportation facilities it is also true that the whole surroundings and atmosphere are rural in nature and, therefore, affords the proper setting for an institution of this kind.

BUILDINGS AND EQUIPMENT

"Plans are under way for the necessary buildings and equipment. There will be one main building of considerable size which will afford class rooms and laboratories. There will also doubtless be other smaller buildings for live stock and seed work as well as the usual farm buildings. It is not proposed to erect dormitories, as excellent board and lodging can be secured in the town at reasonable rates. Just how rapidly the work of construction can be pushed forward may depend somewhat on the progress of the war, but in any event it is expected that this institution will be ready to take an important place in the after-war development policy of the Government."

AN EXPERIMENT IN ORCHARDING

ONE of the most interesting experiments at Vineland already showing results is the large apple orchard devoted to cultural and pruning tests. This block

consisting of some 600 trees was planted five years ago and is made up of the following varieties set out as yearling whips; Hyslop, Spy, Greening, Baldwin, King, Hubbard-

ston, Cranberry, Johnathan, McIntosh, interplanted with Dudley, Duchess, Wagner, Wealthy, and Ontario. In all there are thirty-three rows, the first being winter-pruned, the second summer-pruned, while the third row has not been touched since the first shaping up. This plan has been followed consecutively through the entire block for the five seasons with very marked results.

The winter-pruned trees have received the usual treatment as practised in Ontario, being headed back and thinned out every year. Those treated in summer have received very light pruning, crossed limbs or those that would be useless later being removed. Almost no heading back was done except taking out the terminal buds from the highest branches. While receiving

so little pruning these trees have a good frame-work to make a tree capable of bearing a heavy load. The third row in each case has not been touched since the initial pruning.

The results are very uniform throughout, the summer-pruned trees and those not treated being loaded with fine marketable fruit, while the winter-pruned trees show hardly an apple. There appears to be no doubt that summer-pruning will bring the young orchard into profitable bearing much quicker than the plan usually followed of heading back severely every season.

Another striking result in this block of trees is the difference shown between the cultivated and sod sections. Despite the very wet spring and early summer the trees in sod are much poorer in foliage and vigour.

THE HILL SELECTION OF SEED POTATOES

EXPERIMENTS in the selection of the tubers of potatoes for seed have been carried on at the Ontario Agricultural College for a number of years. Good results have been obtained by what is termed the Individual Hill and Tuber Selection. Dr. C. A. Zavitz, Professor of Field Husbandry, recommends this method as one of the best and most interesting which can be followed in obtaining an improved strain of potatoes, either for home use or for commercial purposes.

This method can be carried out in the large field, the market garden, the family patch, or the nursery plot where potatoes are grown. In ordinary culture, however, the potato sets usually vary in size, and consequently the hills vary in productiveness. In order to select most readily those hills possessing the power of reproducing desirable characteristics, care should be taken to plant tubers or sets which are uniform in size. In commencing the work, therefore,

it is not only important to use the best variety obtainable for the purpose, but also to give the potatoes in the individual hills an even chance for development. When the crop is beginning to ripen there is frequently a noticeable variation in the appearance of the plants. This permits of a selection of the hills having vigorous plants with the best foliage and the least amount of late blight and of other diseases. The hills can be marked by driving stakes or laths beside those selected. Another examination of the crop can be made in a week or ten days, and still another at a little later date, and, if necessary, some of the stakes changed according to the appearance of the plants. A few days after the tops die the selected hills can be carefully dug with a potato fork and examined individually. The product of each hill showing a good yield of uniform tubers of desirable appearance and free from scab, rot, or other diseases can be placed in a separate bag and

numbered. The selected potatoes should be kept in a cool, dry, dark cellar during the winter and early spring. At planting time a uniform number of the best potatoes from each bag can be selected and each tuber cut once lengthwise and once crosswise, thus making four sets comparatively even in weight. Two feet could be allowed between the sets and three feet between the tubers in every row. Each tuber of four sets would require 9 feet of the row. The length of the rows, therefore, would be 45 feet if five tubers, 54 feet if six tubers, and 63 feet if seven tubers were used from each bag. Three feet is a good distance to allow between the separate rows. Comparative examinations can be made of the tops in the growing season and of the potatoes in the autumn, which have been produced from the individual sets, from the individual tubers, and from the indi-

vidual hills. This gives an exceptionally fine opportunity for determining the comparative results of the different selections regarding vigour of growth, freedom from disease, and type, uniformity, production and quality of potatoes. Tubers can be taken from the best hills, or from the best groups of four hills, or from the best rows for further selection, for comparative tests, or for both.

In developing the foregoing system some interesting work has been done at the College. For instance, individual hill selections were made from the Davies' Warrior potatoes in 1910 and again in 1911. Eleven of the best strains resulting from the selections have been tested in duplicate in each of the past three years and the following table gives the average results of each of four of these strains as tested in each of the years 1913, 1914 and 1915:—

SELECTIONS	Percentage, Table Quality, 1915	Yields of Potatoes per Acre (Bushels)			
		1913, 2 Tests	1914, 2 Tests	1915, 2 Tests	Average, 3 Years, 6 Tests
Selection No. 5	74	210 0	321 0	199 2	243 4
“ “ 2	72	197 5	285 7	166 3	216 3
“ “ 1	71	191 3	253 6	127 5	190 8
“ “ 8	71	145 0	177 1	86.5	136 2

These strains were all started from carefully selected hills of promising characteristics, and yet the results show most decided differences in productiveness. The Davies' Warrior potatoes in the variety tests, where no hill selection was used, gave an average of 136.6 bushels per acre per annum for the same period.

This work has been valuable in furnishing a strain of Davies' Warrior potatoes which has given an average annual yield of fully one hundred bushels per acre over the ordinary variety. It has also emphasized the value of the application of a good system of selection in the improvement of the potato crop.

DISTRICT REPRESENTATIVES' CONFERENCE

THERE was a complete gathering of the District Representatives of the province of Ontario at the annual conference held in the Private Bills Committee Room, Parliament Buildings, Toronto, on August 29th, 30th, and 31st. Mr. C. F. Bailey, Assistant Deputy Minister of Agriculture, occupied the chair.

OFFICE MANAGEMENT

The whole of the forenoon on the first day was devoted to the discussion of office management, and keeping records and accounts, with a view to the adoption, as far as possible, of one uniform system. Mr. R. S. Duncan, District Representative from Port Hope, opened the discussion with a paper on Office Records; Messrs. D. A. McRae and J. N. Allan, from Alexandria and Hamilton, respectively, following on Duties of the Stenographer; Mr. A. P. MacVannel, Picton, dwelt on the Assistance Required; Mr. J. W. Noble, from Essex, on Monthly Accounts, and Mr. M. H. Winter of Renfrew on County Grants. In the course of discussion many valuable suggestions were made.

SCHOOL FAIRS

The entire afternoon of the first day was devoted to the consideration of school fairs. Mr E. P. Bradt, Morrisburg, spoke on Securing Seed Locally; Mr. R. Schuyler, Paris, on Poultry Breeding Stations; Mr. M. C. MacKay, Walkerton, on Plot Inspection; Mr. R. N. Tipper, Whitby, on a School Fair Day, and Professor A. MacLaren, Lecturer on Rural Sociology at the Ontario Agricultural College, dealt in an interesting manner with the class of sport that should be encouraged. He not only suggested the lines that should be followed, but advised that District Representatives and the parents

and guardians of the children should interest themselves in the pastimes of the young folks to a greater extent than they were accustomed to. Much of a wholesome nature in the encouragement of healthy recreation could be done in connection with school fairs.

TRAINING THE YOUTH

In the evening attention was devoted to the encouragement of courses in agriculture for members of the farmer's family. It was pointed out that from these courses had been born the junior farmers' associations, which were rapidly growing in extent and influence. It was a case of training the young the way they should go. In this connection competitions for boys and girls that are annually held formed the main subject for discussion. Mr. J. Laughland, Collingwood, opened with a discourse on Courses in Agriculture; Mr. J. W. Stark, Brampton, following with an address on Junior Farmers' Improvement Associations. Messrs. J. C. Steckley Newmarket, A. D. MacIntosh, Stirling, J. B. Curran Napanee, J. S. Knapp, Galt, and G. R. Green, Woodstock, dealt respectively with Acre Profit Competitions, Dairy Profit Competitions, Feeding Hogs for Profit Competitions, Baby Beef Competitions, and Intercounty Live Stock Competitions.

FIELD DEMONSTRATIONS

The morning of the second day was devoted to consideration of field demonstrations and field meetings. Mr. J. R. Spry, of the Ontario Agricultural College, gave a practical address on Drainage Demonstrations and their Value; Mr. C. W. Buchanan, Dutton, spoke on Field Demonstrations and how to make them effective; Mr. P. R. Cowan, of the Central Experimental Farm,

Ottawa, dealt with Potato Selection, in the absence of Dr. Güssow, Dominion Botanist, who was unable to attend.

CO-OPERATION AND MARKETING

In the afternoon Mr. G. A. Putnam, Provincial Superintendent of Institutes, spoke on County Boards of Agriculture; Mr. F. C. Hart, Director of the Co-operative and Markets Branch, on Co-operative Buying and Selling; Mr. J. H. Hare of the Dominion Live Stock Branch, on Egg Circles, during which some instructive information was given on the growth of the movement, see this number of THE GAZETTE, page 867, and Mr. L. H. Newman, Secretary, Canadian Seed Growers' Association, on Inspection and Sale of Registered Seed.

CARE OF AUTOMOBILES

Mr. H. A. Dorrance, Orangeville, gave an interesting description of experience on farmers' automobile tours. As the District Representatives now generally make use of automobiles an expert in the care of the machine was called upon to give an address on the use of lubricating oils. The important point was noted that oftentimes when complaint was founded on the supposition that the oil was too heavy, it was really too light. The speaker advised consultation in this matter with local oil agents, as a great deal of the durability, length of wear, and ease of travel, depended on the lubrication.

FARM MANAGEMENT FROM A BUSINESS POINT OF VIEW

In the evening the subject of Farm Management and Keeping of Farmers' Accounts engaged exclusive attention. Mr. A. Leitch, Lec-

turer in Farm Management at the Ontario Agricultural College, was the first to address the conference. He was followed by Mr. E. H. Brown, of the States Relations Service of the United States Department of Agriculture. The latter gentleman gave an especially carefully prepared and informative address dealing with the unwisdom of farmers making a hobby of one branch of agriculture to the neglect of the other branches and with the desirability and necessity of business methods in farm management.

CO-OPERATIVE FIELD EXPERIMENTS

The last session held on Thursday morning, August 31st, was devoted to addresses and discussions on Co-operative Field Experiments; Variety Tests; and Campaigns Against Smut, Grasshoppers, Army Worms, and other Pests, the leaders being Mr. J. E. McRostie, of Kemptville, in the first instance, Mr. F. Forsyth, of Perth, in the second instance, and Mr. H. C. Duff, of Markdale, in the last instance.

At the close of the session on Wednesday afternoon the representatives were shown over a local automobile establishment and treated to some advice and information on the construction and care of the machine generally and of the various parts in particular.

On Thursday and Friday afternoons, Deputy Minister Roadhouse and Assistant Deputy C. F. Bailey escorted the representatives through the Canadian National Exhibition. An innovation at the conference was a system of fifteen-minute talks following the leading addresses on the different subjects. These talks proved very interesting and instructive, resulting in a wide exchange of opinion and experience.

EDUCATION IN AGRICULTURE AT TORONTO EXHIBITION

AN exhibition fails in its mission if it is not educational. The more it is made so the greater its usefulness to the community. At the Canadian National Exhibition in Toronto this phase has never been lost sight of. In fact the same can be said of all community exhibitions, for everyone in these days devotes time, space and money to development in educational directions. At Toronto, however, owing to its wide area and extensive buildings, the educational features are especially worthy of notice. Of course all exhibits of this class partake of this character, seeing that they are intended to create a desire for emulation, but reference is here intended particularly to those displays mainly furnished by institutions and organizations designed to be wholly educational, such for instance, as the Ontario Agricultural College and the Ontario Veterinary College. Each of these centres of learning found accommodation for samples of their industry, and for specimens connected therewith, in the imposing and spacious structure known as the Government Building. They were close and allied neighbours, and all the days long attracted the attention of throngs of interested visitors. Each institution, too, had experts in attendance to answer questions and to supply any information desired. Each was also under the personal supervision of its principal, the Ontario Agricultural College of Dr. G. C. Creelman, and the Veterinary College of Dr. E. A. A. Grange.

THE AGRICULTURAL COLLEGE

While the Ontario Agricultural College display was hardly as large as usual it was of a decidedly comprehensive character, comprising samples of the produce of nearly every activity in which the College

is engaged. There were also entomological specimens. There were samples of fruit and vegetables in various stages of ripeness and in various stages of decay from insect or disease, but the pride of the exhibit was the sheaves of cereals for which the college has earned national fame. There were a dozen or more of the leading varieties of wheat, both winter and spring, of oats, barley, spring and winter rye. There were also tubes containing grain grown at different dates under different conditions and the result of varying combinations. Special prominence was given to the O. A. C. variety of oats No. 72, which it is proudly stated was started at the college in 1903 from a single seed, and has since then established an almost unequalled record as a prize winner and for excellence and for prolificness. Owing probably to the success of Marquis wheat in the West and in international competition, and which was started into being by the late Dr. A. P. Saunders at the Experimental Farm at Agassiz, B.C., in the year 1892, and brought to a state of perfection between 1903 and 1907 by Dr. C. E. Saunders, the present Dominion Cerealist, at the Central Experimental Farm, Ottawa, as detailed in THE AGRICULTURAL GAZETTE, Vol. II. page 1042, some superior samples shown attracted much attention and elicited many inquiries. A sample of the new variety of winter wheat, O. A. C. No. 104, which the College is now introducing for the first time, was also the subject of much curiosity. It is a plump healthy looking grain obtained from crossing the Dawson's Golden Chaff and the Bulgarian. Its initiatory record is that it has given a larger yield of grain per acre than the Golden Chaff and possesses better bread-making qualities. Of course the celebrated O. A. C. barley, No. 21, was given due

prominence. Like the No. 72 oats this variety originated at the College from a single seed and in the same year. In rye the varieties shown were the Mammoth White winter and the O. A. C. No. 61 spring. Particular interest was manifested in the information supplied of results from different dates of seeding and periods of growth. In short, the whole excellently arranged display was of an invaluable instructive character. Literature, it might be mentioned, was in plain evidence both in book and leaflet form.

THE VETERINARY COLLEGE

The Ontario Veterinary College exhibit was largely composed of anatomical specimens or illustrations, a figure of a horse with its structural elements plainly indicated forming a leading feature. Entomology is a subject recently introduced in the College and specimens were shown from the embryotic state to maturity of creatures that affect horses and cattle.

OTHER EXHIBITS

In the same building, that is in the Government Building, the entire contents of which can be described as of an educational character, were shown the wool exhibit of the Federal Department of Agriculture, to which several references have already been made in THE AGRICULTURAL GAZETTE (See Vol. II, page 835, and Vol. III, page 512) and displays of products from the Western provinces, especially of woods

and fruit from British Columbia and cereals and vegetables from Alberta, Saskatchewan and Manitoba, and, of course, from Ontario, which came out strong in minerals, in the results of crop competitions, and in the products and industries of the public institutions of the province. Referring to the last mentioned the exhibit of beautiful fancy work wrought by the female patients of the asylums and of the handsome and substantial woodwork done by the men was the object of much admiring comment. In connection with this a statement made by Dr. English, of Hamilton, who was in charge of this division, that as a result largely of employment as many as 46 per cent of the patients had been sufficiently cured to warrant their discharge, is noteworthy. Another particularly interesting exhibit was that from the recently established institution at Burwash, 240 miles north of Toronto. From this previously supposed unproductive region of clay, came potatoes of size, healthy-looking celery, cucumbers, egg plant and rhubarb. In this building also space was found for the toy exhibit of the Trade and Commerce Department of the Dominion, the Ontario Health Department, and the Horticultural Experimental Station and the Fruit Branch of the Dominion. The egg exhibit of the Live Stock Branch, of the Dominion, which, as in the case of wool, has already been described in THE AGRICULTURAL GAZETTE (*vide* Vol. III, page 695) occupied its customary space in the Dairy Building.

Nature-study is agriculture for young children, and agriculture is nature-study for older children. One subject merges imperceptibly into the other. For the primary and elementary grades we call it Nature-Study; for the upper grades we call it Agriculture.—“Nature Study and Elementary Agriculture”—Hamilton.

SASKATCHEWAN

CO-OPERATIVE POULTRY MARKETING STATIONS

THE Provincial Department of Agriculture announces that a co-operative poultry marketing project will again be conducted this fall. Two receiving and killing stations will be operated from November 13th to December 16th, one at Saskatoon to serve the northern half of the province, and one at Regina for the southern portion. Poultry producers throughout the province are invited to fit up their birds and ship them in alive to whichever station may be most convenient.

Experts provided by the Poultry Husbandry Department of the Saskatchewan College of Agriculture will supervise the killing, plucking, grading, and packing. All classes of

poultry, including chickens, turkeys, ducks and geese, will be handled. When the birds are received, the Co-operative Organization Branch of the Department of Agriculture will forward producers an advance payment at graduated prices, consistent with the quality of the birds. The poultry will either be sold immediately or should the market be low, placed in storage until a satisfactory price can be obtained, and, when all of the birds have been disposed of, final payment will be made which will return to the producer every cent realized from the sale of his birds, less the cost of transportation, killing, boxes, and storage.

POTATO SELECTION WORK AT SASKATOON

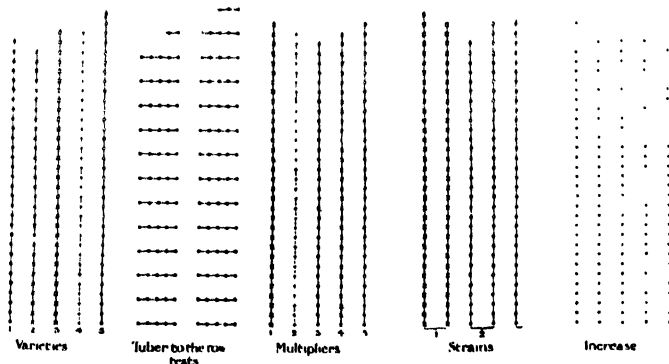
BY JOHN BRACKEN, B.S.A., PROFESSOR OF FIELD HUSBANDRY, COLLEGE OF AGRICULTURE

NO long time experiments showing the effect of continuous hill selection on the yield

and quality of potatoes have been undertaken at Saskatoon. Some data is available showing the first year effect of such selection; and the three-year average yields of pure line strains out of several varieties throw some light on the value of this work. The following figures summarise the average yield from large producing, medium producing, and small producing hills of each of nineteen varieties:

DIAGRAM SHOWING PROGRESSIVE STEPS IN THE IMPROVEMENT OF POTATOES

DEPARTMENT OF HUSBANDRY
UNIVERSITY
SASKATCHEWAN



Average acre yield from very productive hills, 655 bus.

Average acre yield from hills of medium productiveness, 485 bus.

Average acre yield from hills of low productiveness, 366 bus.

These tests were made in the year 1912. Since that time many of these strains have been discarded, but, from a few of those we are still carrying, the following three-year average yields have been secured:

but only two need be mentioned. The mother strain of "Maple Leaf" produced 128 bushels 13 pounds as an average yield over three years; the best strain out of it produced only 120 bushels 18 pounds and the poorest 104 bushels 34 pounds per acre. Early Rose, mother strain, produced 156 bushels 21 pounds, the best selection from it 151 bushels 58 pounds and the poorest 113 bushels



POTATO SELECTION WORK AT SASKATOON

A Poor "Tuber Row"—the Four Hills Immediately Behind the Label are from Sets Cut from one Tuber

	Bus.	Lb.
State of Maine—Mother strain	155	56
Large producing strain	188	56
Medium producing strain	142	53
Low producing strain	134	01
Vermont Gold Coin—Mother strain	135	24
Heavy producing strain	158	38
Heavy producing strain	152	26
Medium producing strain.	128	28
Low producing strain.	98	49

Our selection work, with the two varieties above mentioned, has resulted in securing much greater improvement than with some of the other varieties. Several instances illustrating this fact are available,

30 pounds; these figures also are three year averages. It is possible that if a larger number of selections had been made, more productive strains might have been secured.

We are convinced that the plant row or tuber row method of selecting the tubers to be used for seed is a practice that must be followed if we are to increase or even maintain the productiveness of our present varieties. For this reason we are developing a plan which permits us to select the most productive hills or strains from each of our varieties

every year. The photograph attached shows the progressive steps in the improvement of potatoes by selection as followed in the Department of Field Husbandry. It will be noticed that these steps include:—

- (1) Variety testing.
- (2) Tuber to the row tests.
- (3) Multipliers—(best tuber rows increased).
- (4) Strains.
- (5) Increase of best strains.

In actual practice two slight modifications of this plan have been made.

The tuber to the row tests run parallel with the varieties and other rows and, instead of there being five hills from each tuber, four only are used, and where the fifth would come, the space is left vacant. Occasionally also the variety test itself may be made up of four hills each from the required number of selected tubers, thus getting at the same time the productiveness of the variety and opportunity for selecting the most productive tuber rows as well.

THE BETTER FARMING TRAIN

BY A. M. SHAW, B.S.A., PROFESSOR OF ANIMAL HUSBANDRY, COLLEGE OF AGRICULTURE, SASKATOON

THE Better Farming Train was operated this year for a period of five weeks on the lines of the Canadian Northern Railway in central and northern Saskatchewan and, judging by the very large attendance and the keen interest manifested by the visitors, it was a genuine success.

This year's train was better equipped and more complete than any of the trains of previous years. There was something of interest to everyone, from the youngest child to the oldest man or woman present. Provision was made for taking care of them all. Many of the lectures and demonstrations were put on simultaneously. While the men listened to the lectures of special interest to them on live stock or crop production topics, the women were attending a lecture or demonstration in the Household Science Department, the children of school age enjoying a lantern lecture and the small children and babies collected in the nursery car where they were taken care of while their parents were attending the various lectures in other parts of the train. The programme was announced at the beginning of each meeting and a certain amount of choice given the people

as to the lectures they might wish to attend.

These trains are the result of a co-operative movement between the Provincial Department of Agriculture, the College of Agriculture and the railways. In this case the Canadian Northern furnished and operated the entire train. The Department furnished part of the exhibit material and a number of lecturers, arranged the itinerary and were responsible for the programme. The College furnished the major part of the exhibits including the live stock carried and also a number of the lecturers and demonstrators.

The train consisted of some fifteen cars in all, ten of which were used for demonstration or lecture work.

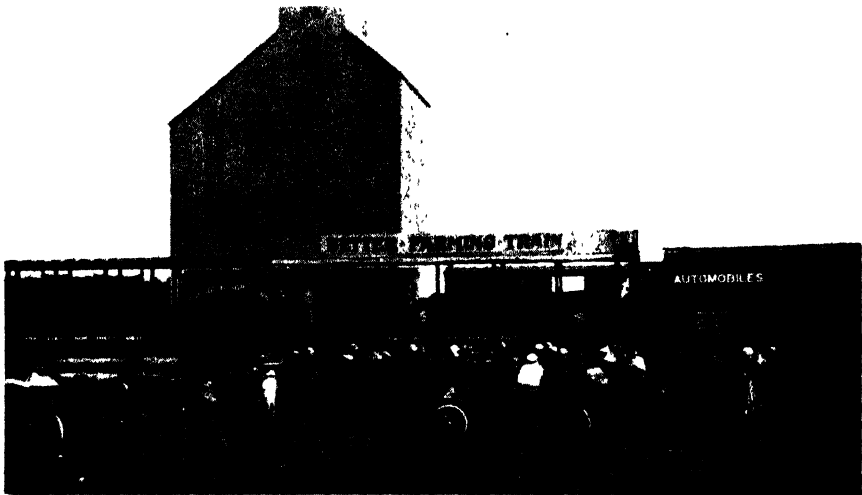
ANIMAL HUSBANDRY SECTION

Four cars were given over to this work. Two of them were automobile cars with end doors. These were fitted up with stalls in which were representative types of Short-horn, Holstein, Ayrshire and Aberdeen-Angus cattle. A flat car divided into pens with wire sides was given over to the sheep and swine exhibit. Representatives of the Yorkshire, Berkshire and Tamworth

breeds were carried and in the sheep a number of range ewes with lambs sired by Southdown, Shropshire and Suffolk rams. A young Clydesdale stallion was used for demonstration purposes to illustrate the desirable points in the draft type of horse.

A flat car enclosed with a wire fence was used for demonstration purposes. The animals were brought out on this car and exhibited there, the lecturer speaking from the flat car to the audience on the ground. This method of showing stock has proved a success as it eliminates the crowding that always occurs when

nection with the raising of horses, but in cattle, sheep and swine as well. Animals were carried and exhibited showing the marked improvement brought about by the use of a pure-bred sire. One illustration was particularly apt. Three animals were brought out on the demonstration car, the sire an Aberdeen Angus bull, 6 years old and weighing 2,050 pounds, the dam a common grade cow, just an average of the common cows of the country, not as good a cow as many farmers in the district owned, and a black steer, the first calf from the common cow, age 22



SUPERIOR SIRES EXHIBITED

animals are on the ground. In this way everyone can see the animal distinctly as it is above them, and in clear view of all.

Probably more prominence was given to the live stock section than to any other, due in a measure to the fact that a large part of the country which was being covered was one specially adapted for stock raising. The important point dwelt upon by Professor A. M. Shaw of the University of Saskatchewan, who was in charge of the live stock work, was the importance of using a pure-bred sire. Not only was this emphasised in con-

months and weighing 1,350 pounds. The whole lesson was there, the good sire, the common low grade dam and the offspring from this mating shown in the black steer who was a vast improvement over his dam. The point was made clear that it was impossible to raise steers like the one shown from common cows if mated to scrub or grade sires, but quite possible to raise good ones even in the first cross if pure-bred sires were used in every case. The same was illustrated in the case of sheep. Range ewes were shown with their lambs sired by pure-bred

rams. The lambs in every case showed a marked improvement over their dams.

Other phases of livestock work were also taken up by Professor W. H. J. Tisdale of the University of Saskatchewan and Mr. P. F. Bredt, Acting Live Stock Commissioner for Saskatchewan. Mr. W. L. Kirkpatrick and Mr. H. B. Summerfelt assisted at various times throughout the trip.

FIELD HUSBANDRY SECTION

This section of the train was in charge of Professor J. Bracken of the

forage crops and alfalfa. Western rye, Brome grass, Sweet clover and Winter rye came in for a great deal of discussion.

MECHANICAL SECTION

This part of the train consisted of a baggage car in which was arranged a unique and exceptionally comprehensive exhibit in charge of professor A. R. Greig of the University of Saskatchewan. Sectional models of gas and steam engines, a small working model of a pneumatic water supply system, a model dairy with cooling tanks, cream separator and



SCHOOL CHILDREN INTERESTED IN BETTER AGRICULTURE

University of Saskatchewan, assisted at various times by J. G. Rayner, Hy. Saville, L. E. Kirk and J. S. Naylor. The Honourable W. R. Motherwell, Minister of Agriculture for Saskatchewan, who accompanied the train during a large part of its itinerary, lectured twice daily on subjects such as forage crops, methods of tillage, etc. The topics dealt with by the lecturers were pertinent ones and suited to that particular part of the province where the meeting was being held. Great interest was taken in the talks on

tester. An electric light equipment suitable for a farm was installed in one end and used for lighting the mechanical car, and a dark car next to it, which was used for lantern lecture work. A line shaft was installed and all the machines were shown in actual operation. A large number of models of farm buildings together with many mechanical devices made up the balance of the equipment. This car proved to be a great source of interest to the farmers and was crowded at all times. The lectures given by Professor Greig

dealt with building construction, the use of concrete on the farm, water supply, and by Professor Smith, on farm machinery, draft of implements and horse power.

POULTRY SECTION

The poultry car contained many models of poultry buildings and devices of interest to poultry men. A candling booth was equipped at one end of the car and demonstrations in the candling of eggs given almost continually. Professor R. K. Baker, of the University of Saskatchewan,

demonstration car was crowded to its full capacity at nearly every meeting.

Mrs. Peter Yemen and Mrs. Sarah Dracas were with the train and assisted in the woman's section by lecturing on various topics of interest to women. This branch of the work is a very important one and highly appreciated by the women of the country. Many of them coming long distances to see the demonstrations and hear the various lectures. One woman told Mrs. Archibald she had driven 65 miles in



INTERIOR OF THE HOUSEHOLD SCIENCE CAR

was in charge of this department and assisted by E. A. Lloyd. Mr. Ault and Mr. R. Allen, both representatives of the Poultry Division of the Dominion Live Stock Branch, Ottawa, were with the train a part of the time and gave addresses on the collecting, candling and grading of eggs.

HOUSEHOLD SCIENCE

This section in charge of Mrs. Raymond Archibald, assisted by Miss Esther Thompson, proved to be a very popular feature and the

order to attend.

BOYS' AND GIRLS' SECTION

This part of the train was in charge of Mr. F. W. Bates, Director of School Agriculture for Northern Saskatchewan. The lecturers included Mrs. W. W. Thomson, Regina, Messers. J. G. Rayner, W. W. Thomson and J. S. Naylor. Lectures illustrated by lantern slides were given by Mrs. Thomson on birds and insects native to Saskatchewan, while other lecturers dealt with noxious weeds and beautifying the homes

and school grounds. A special car was devoted to the boys and girls, models of school houses and grounds being exhibited and pictures and charts shown of such a nature as to appeal to the children of school age. Besides getting a full programme specially prepared for them all the children were taken under escort over the entire train and the various exhibits explained to them as they passed through. This department is full of promise and the keen interest taken in the work by the little folks augurs well for the future rural life of Saskatchewan.

NURSERY SECTION

Last but by no means least was a car specially equipped with a sand box, a slide, cots and numerous toys where the little children and babies were gathered together and taken care of while their elders attended the lectures in other parts of the train.

Mrs. L. E. Kirk and Miss J. Gillespie were in charge and were unusually successful in handling large numbers of children. So popular was the nursery car that at some meetings as many as 40 babies could be seen playing contentedly for hours at a time.

Two meetings were held each day and in nearly every instance were uniformly good. Several places declared a holiday to allow all the people to visit the train. The school children from many of the outlying districts were brought in by their teachers, credit being given by the Department of Education for one day schooling spent in this way.

In all 22,973 persons visited the train, composed of 8,245 men, 5,510 women and 9,218 children. Some points turned out record-breaking crowds, as for instance, Melfort, where 965 people visited the train in one forenoon.

BRITISH COLUMBIA

COW-TESTING WORK

BY T. A. F. WIANCKO, PROVINCIAL DAIRY INSTRUCTOR

THE first cow-testing associations in British Columbia were organized under the supervision of the Dominion Department of Agriculture in the year 1906. At that time associations were formed in the following districts: Nanaimo, Salt Spring Island, Cowichan, Chilliwack (two associations) and Armstrong. With the system then followed, the weighing and sampling of the milk took place at the farms at definite intervals; for example, on the 10th, 20th and 30th. The weights obtained were entered on a form provided for the purpose, and these brought, together with the samples, to a central point, usually the local creamery, where they were tested for butter fat by the supervisor whose duty it was to come around once each month to do the

testing. At the conclusion of the work the butter fat tests were entered up against the weights of milk, and these were sent to the Agricultural Department at Ottawa, where the necessary calculations occurred, and from whence the results were transmitted to the members.

This system was followed for a year or two with fair success, but gradually members fell out of the association to such an extent that there were not enough cows under test to profitably employ a man solely for testing. The Department then arranged with the managers of the various creameries to carry on the work, the latter being paid at the rate of 5 cents per month for each sample tested.

This system of testing was carried

on more or less spasmodically for several years, until in the year 1912 there were only three surviving associations, with a total of 34 members, and 170 cows.

In looking back over this work, the following may be set down as the main reasons for the work failing to measure up to the anticipations of the members:

1. The weighing and sampling was often hurriedly and carelessly done, and in many cases left to irresponsible hired help.
2. Often only a few of the cows which were believed to be the best were submitted to the test; the poorer ones, concerning which information was needed, were ignored.
3. Cows were tested only for short periods because the job became wearisome and interest failed.
4. The samples being often carelessly taken, great variations were shown in the tests from month to month, and in consequence, the farmer was not satisfied with the results.
5. In a few instances some farmers for the sake of quickly building up a high producing herd for subsequent sale, took unfair samples and weights.
6. Food costs were seldom taken into consideration; consequently little was learned about the real comparative value of the different cows in a herd.

The member who did all his own work of feeding, weighing and sampling, and who did his work carefully and conscientiously, made much progress, and many good herds to-day are to be traced to a careful weeding-out process carried on by these men.

On January 1st, 1913, the Federal Department of Agriculture, by mutual agreement, placed the cow-testing association work in British Columbia under the control of the provincial authorities.

The following copy of a circular made use of in this work briefly describes the type of association of which we now have a number in successful operation:

DEPARTMENT OF AGRICULTURE
(Live Stock Branch)
COW-TESTING ASSOCIATION

In any district offering, within reasonable reaching distance, a minimum of 400 cows, the Live Stock Branch of the Department of Agriculture will assist in instituting and conducting a Cow-testing Association, to be organized and incorporated under the Agricultural Associations Act.

The plan to be followed provides that a competent tester, fully equipped, shall proceed from farm to farm of the members in turn, and, staying overnight, shall weigh, sample and test the night and morning's milk of all cows, and enter the results obtained, with the value of butter-fat computed at current rates, in a book which is left with the farmer. He will also keep account of the food fed the cows, valuing the same on a basis set by the directors of the association for the current period. He will call nine times each year at each farm when the weighing and recording of the milk of all the cows is carried out daily, and twelve times each year at all others.

It shall be the duty of each member of the association:

- (1) To provide board and lodging for the tester while engaged in this work at his farm.
- (2) To convey the tester to his next destination, the route being arranged for the convenience of all parties.
- (3) To pay to the Secretary of the Association a yearly membership fee of to cover cost of chemicals, breakages, etc., and also at the rate of one dollar (\$1.00) per cow per annum, payable at the end of that quarter in which the testing of each cow commences.

The Live Stock Branch will provide the complete testing outfit and all books, forms and sheets necessary for the carrying out of the work. It will also find a competent tester and undertake to advance his salary monthly, settling for the same with the secretary of the association quarterly.

Members must engage to submit all their cows to the test and to continue in the association for two years unless they sell out or remove from the district.

The first of these associations was established in the Chilliwack Valley in May, 1913. Previous to its organization, the district was thoroughly canvassed by a member of the Dairy Division, and the subject was thoroughly discussed at a number of public meetings.

The testers secured by the Dairy Division for this work are men with good training in official test-work, and possessing, also, dairy farm experience.

In addition to the attention given to the sampling and testing which are done by the man in charge, the cost of feed per cow is worked out in close consultation with each dairyman personally, and this has awakened the interest of many men who were feeding all cows alike regardless of individual production. These men are now endeavouring to get each cow to do her best, feeding liberally, but not measuring out high-priced feeds to cows lacking in dairy tendency and in the capacity to turn feed into profitable quantities of milk and butter-fat.

The distinguishing and outstanding feature of this system of cow-testing work lies in that the *feed is given consideration*, and that *authentic records are produced* because the work is carried out by disinterested parties. This is of known importance in the making of official or semi-official records, or any records which are to be received by the public at face value. On the strength of these records dairy cattle may be safely bought or sold, as they will come to be more and more in the future.

The records are also for the *full period of lactation*, which point Mr. C. F. Whitley, the Dominion official in charge of cow-testing, laments is often neglected, resulting not only

in incomplete, but in misleading records. The persistent milker with a relatively small yield may make a better showing for the year than another with a brilliant, but brief, lactation period.

In figuring out the cost of production from each cow, food costs only have been considered, no attempt having been made to charge up to the cow such items as labour, interest, depreciation. The feed values in general use among the association, are somewhat about as follows:

Pasture, \$1.00 to \$2.00 per month.
Hay, \$8.00 to \$10.00 per ton.
Oat hay, \$8.00 to \$10.00 per ton.
Mangels, \$3.50 per ton.
Turnips, \$3.00 per ton.
Corn or Clover silage, \$3.00 per ton.
Green feed other than cut grass and clover, \$2.00 per ton.
Grain, bought:—Price per car-load lots.
Grain, home-grown, price per car-load lots minus 30 per cent.

Some of the most noticeable results of the association work are:

(1) Marked improvement in the feeding of dairy cattle, and especially in the greater use of supplementary green feeds, fed during the summer and early fall months, when green clover, oats and peas, kale, green corn and the like are used to great advantage.

(2) More interest is being taken by the farmer in individual cows, and the records kept are teaching him how much cows do produce in a lactation period, and what it costs in feed to get that production.

(3) There has been a decided change in regard to grain feeding. Instead of the old way of feeding all cows alike, regardless of the amount of milk produced, the individual cow is receiving grain according to her need in keeping up the milk supply.

(4) The use of pure-bred sires, and the culling out of the poorer cows, are gradually raising the production of milk and butter-fat. The better feeding and care of the calves and young stock will have a very marked improvement on the standard of the cows of the future.

(5) The production of a cleaner milk, more regularity in milking, the building of more sanitary barns and dairies, more light, better ventilation, and better water supply.

(6) Early stabling in the fall, protection from cold rains, and protection from flies in summer.

PART III

Rural Science

THE TRAINING OF TEACHERS FOR AGRICULTURAL INSTRUCTION

PRINCE EDWARD ISLAND

BY W. R. REEK, B.S.A., DIRECTOR OF AGRICULTURAL INSTRUCTION

ALL Prince Edward Island teachers receive their licenses from the Prince of Wales College at Charlottetown. The Normal Course or course in teacher training, though short, is given during the terms that they attend the College. Rural Science is a recognized subject on the curriculum of the College. Every teacher from this year forward will receive a sufficient training in Rural Science and in methods of teaching the same, in order that the work in the public schools shall be comparatively simple and easy, and still vital.

J. E. McLarty, B.S.A. is in charge of the Department and will do practically all the necessary teaching, except where there are subjects that have been taught for years, such as Botany, etc. Mr. McLarty is a recent graduate of the Ontario Agricultural College; previous to this he taught school in Ontario, and holds a second-class license in that province.

The curriculum is not definitely mapped out as yet because this is the first year that the Department has been prepared to assume proper responsibility. It is less than one year since Professor S. B. McCready came to organize it. There were last spring three regular periods per week for each class. The work will

cover botany, entomology and geology just in so far as is needed or as can be given—in any case the work will be very elementary. Poultry raising and the care of eggs, dairying, emphasizing the care of milk and cream, and some ordinary live stock work will be given. Soils, weather and some simple work at measuring will be undertaken. The handling of bees will be demonstrated. The study of cereals and small seeds coupled with weed seeds will receive considerable attention. The growing of flowers will be laboratory work principally—the propagating from slips will be part of the work next spring in the green house. The school garden will be used as a demonstration, illustrating how gardens can be used to teach fundamental principles and some methods necessary in other activities. The perennial border, lately established, will also be used for a similar purpose. Slides suitable for teaching various subjects have also been secured.

A large library has been established and the books have been carefully selected in order that they will meet the demands, not upon students only, but also in order that when students become teachers they will have an intelligent idea regarding school libraries.

Rural organization, methods of and procedure, including simple surveys, will be discussed as time permits. The idea is to better fit the teacher to be a leader in so far as that is possible under the prevailing

conditions.

Every Island teacher will, before receiving a license, be required to pass an examination and will be responsible for the year's instruction.

NOVA SCOTIA

SUPPLIED BY A. H. MACKAY, B.A., LL.D., SUPERINTENDENT OF EDUCATION

TEACHERS to be employed in our Rural Science schools for elementary agricultural instruction have first to pass through at least three years of our high school course, where, in addition to the subjects required of all teachers, they take the courses in botany, agriculture, physics and chemistry. After this scholarship course they are admitted to the Provincial Normal College in September, where their previous work is reviewed and extended under the instruction of professors on the Normal staff and also of those on the staff of the neighbouring and affiliated Agricultural College. This course is described in the Normal Calendar as follows:—

Natural and Physical Science

In the various departments of science-study the character of the work is essentially practical and experimental, and the instructors will, wherever possible, choose their experiments from within the domain of everyday life. Great importance is attached to the application of scientific knowledge to hygiene, domestic economy, and the arts and industries of Canada.

While facilities may be accorded to advanced students to pursue a favourite study, specializing will not be permitted to the detriment of proficiency in any of the branches of the public school programme. All of the studies are pursued for their bearing upon the work of our public schools; and their chief function is, therefore, to equip teachers with such experience and methods as will enable them to awake in their pupils an intelligent interest in their environment.

Botany, biology, and entomology will be treated as subservient to the general science of agriculture, and this, in its turn, to a well co-ordinated universal science—that is, systematized knowledge of that

general character which is more likely to avail the trainer of youth than is a profound insight into some narrow department of science. In short, the ability to interpret ordinary things scientifically will be preferred to narrow specializing.

The well equipped biological and chemical laboratories of the science building, the affiliation of the new College of Agriculture, and the proximity of the Experimental Farm at Bible Hill, as well as of several school gardens operated by the students of the Rural Science school, place the Normal College in a position to satisfy, in respect to opportunity for science study, the needs of the teaching profession of the province.

In general, in the science classes, the student is required to conduct investigations, recording in note-books his observations and inferences, and submitting these periodically to the instructors. In practical agriculture students conduct seed-tests, graft seedlings, germinate seeds for the elementary nature-study classes and for microscopic study, make acquaintance with some of the more troublesome plant diseases and insect pests, and conduct experiments in the heat, light and food supply of various plants, in estimating capillarity and percolation of soils, in root-pruning, etc.

In physics, similar procedure is followed; and problems in mechanics, in meteorology, in specific gravity, specific heat, conduction of heat, sound and electricity, in estimating cohesion, in measuring electrical potential and resistance, in ascertaining etherial and aerial wave lengths, are among those worked by individual students. Several pieces of apparatus have at times been constructed by students; among them, Wheatstone bridges, resistance coils, Ruhmkorff coils, an organ pipe, and various forms of electroscopes.

In chemistry, the following tasks are typical; the preparation of bleaching substances and study of chemical processes in connection; the preparation of materials used in the manufacture of ink, paper, soap, paints, fungicides and insecticides; the distillation of essences, and making of vegeta-

ble extracts; the collection of the by-products of coal gas; the study of processes of disinfection; the study of the digestive processes in the body.

Nature-study, or the adaptation of method of observation and investigation in the lower and intermediate grades of the common school, will receive special treatment, the practical and economical side being dealt with in greenhouses and garden-work and in field-study.

RURAL SCIENCE TRAINING SCHOOL

In April those excelling in the proficiency desired for elementary agricultural teaching are drafted into a special course given by the Dean of the Rural Science training school, Professor C. L. Moore, M.A., F.R.S.C., until the close of the Normal in June.

They are then qualified, if they have passed, to enter the vacation session of the Rural Science training school in July and August, where each candidate can carry out a portion of the following course during vacation time from year to year until he or she is qualified for a Rural Science diploma in addition to a Normal diploma.

The instructors are mostly members of the Agricultural College staff, including the principal. Sometimes specialists from other institutions, who can be secured during the general vacation period, are engaged.

REGULATIONS AND REQUIREMENTS

The more important regulations and requirements follow:—

The curriculum of studies is pursued at the Provincial Normal and Agricultural Colleges through one, two, or three terms of about four weeks each; and, at successive stages in the completion of the same, the student may be granted a certificate, qualifying him for a special grant. On the completion of the course, the candidate is granted a Rural Science diploma qualifying for the highest special grants to Rural Science teachers.

The teaching staff comprises the several science-teachers of the Provincial Normal and Agricultural Colleges; and the laboratories and other equipments of the two provincial institutions at Truro are placed at the disposal of the faculty and students.

Tuition is free. Railways grant single fare tickets on the "Standard Certificate" plan, and students who have done satisfactory work in at least two scientific subjects are recouped the amount of their actual travelling expenses.

Application for admission to the courses leading to a Rural Science diploma will be received from Superior First, First and Second rank graduates of the Provincial Normal College, and from First and Second class teachers specially recommended to the Faculty of the Normal College by the Inspectors on the ground of effective work done in Nature teaching.

Teachers who have been regularly admitted to the Rural Science Training School and have satisfactorily completed during any session any one-third of the whole course, may be awarded aid, not to exceed fifteen dollars per annum, at the close of the school year following.

Teachers who hold a Rural Science diploma regularly awarded by the Rural Science Training School may be awarded aid, not to exceed, \$25, \$50, or \$175 per annum, according as the Director reports the Rural Science work as "fair", "good" or "superior."

Rural Science Diploma Course

1. All candidates for a Rural Science diploma shall be required to complete satisfactorily the following courses; (a) Nature Study one hour per week for one term, (b) Horticulture, three hours per week for one term; (c) Biology three hours per week for one term; (d) Botany, six hours per week for two terms; (e) Chemistry, one hour per week for two terms for those who have never studied Chemistry.

2. Candidates shall elect as "majors" one subject from each of the groups A and B following:

- a. Entomology; Chemistry.
- b. Economic Zoology; Agriculture.

Each major course elected shall involve as a minimum six hours per week class and laboratory work for two terms.

3. Candidates shall elect any two of the following as "minors" involving as a minimum two hours per week class and laboratory work for one term; (a) Bacteriology; (b) Brushwork and Cardboard Work; (c) Woodwork; (d) Mechanics; (e) Weather Work; (f) Geology and Soil Physics; (g) Birds; (h) Plant Diseases.

4. Work done in the Normal College in the following courses will be credited to the Candidate for a Rural Science diploma; (a) Brushwork and Cardboard Work, (b) Woodwork; (c) Weather Work.

NOTE.—No candidate may take more than four subjects each term without special permission of the Faculty.

5. The tests required for the Rural Science diploma will be regular attendance at the class instruction and in the laboratories; a satisfactory report by the instructors on the class, laboratory and field work of the student, and the passing of an examination at the close of the term upon the topics of the compulsory and elected courses. In addition, candidates will be required:—

- (a). To present for examination such collections of natural history specimens properly prepared, mounted and named, as may be required in connection with any subject of the course.
- (b) To submit satisfactory reports on field work, or readings in connection with any subject of the course prescribed to be done between terms.
- (c) To have demonstrated ability to make practical application in the school room of the principles, etc., inculcated in the course, as evidenced by the favourable report of the Inspector on the school conducted for one or more terms by the candidate.

GARDENING AN ESSENTIAL

The school garden is an essential in the courses of instruction; for students are required to work such a garden in connection with the training course. When engaged in teaching they must have school gardens of definite class for certain degrees of grants, or, in the case of the lower grants, home gardens with plans in the school room showing beds and their state of progress from week to week.

In Nova Scotia the Education Department publishes from four to six Rural Science bulletins edited by the Director and sent free to every teacher. These are also republished semi-annually in *The Journal of Education*, which is sent free to every teacher in the province. Thus all teachers are in a position to know what is being done in the Rural Science schools.

NEW BRUNSWICK

BY R. P. STEEVES, M.A., DIRECTOR OF ELEMENTARY EDUCATION

FOLLOWING is a statement in outline of the plans and the policy of the Departments of Agriculture and Education, in respect to Elementary Agricultural Instruction, as carried on in the common school and in the Normal school of the province of New Brunswick:

NORMAL SCHOOL

All student teachers receive instruction in nature and elementary agriculture and in approved methods of imparting such knowledge. Two instructors give a large part of their time to this work. One of these teaches nature and economic plants and conducts school garden work during the spring and fall months. The garden is on the Normal school grounds and the students do most of the work necessary for its maintenance. The other instructor

deals with physics and chemistry, giving considerable attention to soil, fertilizers, drainage, chemical compounds (organic and inorganic), in relation to agriculture. The manual training department supplies to all students instruction of a practical nature in scale drawing, the use of tools and some wood work.

The instructors in these departments are all college graduates with Normal training and large experience in teaching. The instructor in nature and elementary agriculture is also a successful farmer.

RURAL SCIENCE SCHOOLS

Two such schools are permanently established for teachers, both under the control of the Elementary Agricultural Education Division of the Department of Agriculture; length of session is four weeks, two sessions making a full course. The

curriculum of these schools is fully outlined in the annual calendar.

WINTER SHORT COURSES

These are held for such teachers as have been unable to attend summer sessions. They deal with the same subjects—length of session six days.

At both summer and winter courses special care is taken to qualify teachers to deal intelligently with the prescribed nature study and agriculture course. Students at the Rural Science schools prepare ground, and a garden is actually put in not, with the object of having production, but that they may learn by doing, how to teach their pupils in the public schools.

SCHOOL GARDENS

In every public school where teachers who have had special training and who receive agricultural grants, gardens at school are a requirement. These are used as work shops, or laboratories, in which experiments with soil and plants are worked out, correlating indoor instruction with outdoor application. They are also made to serve as a feature of school ground improvement. Both trustee boards and teachers receive grants where there are satisfactory expenditures and work.

All teachers have Normal training for at least one term. Those above third class have a year's such training. Special training is such as has been referred to above.

CERTIFICATES

Certificates of competency are granted only to those student teachers who have satisfactorily completed a two session course at one of the Rural Science schools, and who have during the interim between courses carried out the winter reading and experimental course. Those who take only one session, but who do satisfactory work in their schools, receive minor official recognition.

THE METHODS

As a result of the instruction given in and at the public schools by certificated teachers home plot and project work is carried on by pupils under the supervision of teachers and agricultural officials. The school is thus being made to serve home interests.

School fairs are being organized and the schools are being made centres of social influence. At school fairs exhibitors must certify that exhibits are the product of their own industry. These declarations are also signed by the teacher.

Rural Domestic Science, Farm Mechanics, Mechanical and Scale Drawing, and the study of woods and forests in an elementary manner, are being utilized to some degree in many schools. We seek to have teachers use what they have been trained to apply, to use the things people have, the interests they represent and what they do, as means of education for the young.

ONTARIO

BY J. B. DANDENO, PH.D., INSPECTOR OF ELEMENTARY AGRICULTURAL CLASSES

MODEL SCHOOLS

THE course of study for Model schools does not include agriculture, but an attempt is made to give the instruction in nature study an agricultural trend.

The teachers themselves in the Model schools could hardly be considered qualified to give much effective instruction in this work. Moreover, the curriculum does not give a very prominent place even

to nature study, as the subject has no regular place on the time-table.

As much class instruction and direction shall be given in each of the following subjects as time will permit, but the responsibility for carrying on the course in each, with the aid of the text-book, shall devolve on the teacher in training: - Hygiene, nature study, art, physical culture, music, manners, school law and regulations.

From this it is apparent that agriculture has practically no place at all in the Model schools of Ontario

NORMAL SCHOOLS

The Normal schools now provide a course of study in agriculture under the direct charge of a teacher with some training in the subject. This work is to be strengthened by a suitable equipment. The qualifications of the teacher at present are not all that could be desired, but rapid improvement is being made. Ottawa and Hamilton schools have

now teachers fully qualified in agriculture and the teacher in North Bay holds Part I of the certificate.

The curriculum is now arranged so that agriculture has a separate place with a definite amount of time set apart on the programme.

The school garden is to be a prominent factor in giving instruction and arrangements are being made to provide work in the garden for all Normal school students. To assist in this work the Normal and Model schools in which practice work and observation work is carried on by the Normal school, will provide garden accommodation for the public school classes under a teacher trained in agriculture. This will give much stability to the work.

Two certificates in agriculture are given by the Education Department, -an elementary certificate for public school teachers and an intermediate certificate for high school teachers. Each certificate requires a course covering two consecutive summer sessions at the Ontario Agricultural College.

MANITOBA

BY ROBERT FLETCHER, B.A., DEPUTY MINISTER OF EDUCATION

WE have no special instruction in agriculture in connection with our Normal schools, but students in the second-class course at Winnipeg spend one month at our Agricultural College for special work in economic nature study and work in household science suitable for rural schools. The students who attend our Brandon Normal school in the second-class course receive a series of lectures during the year from members of the staff of the Agricultural College. At this school stress is laid upon the school garden, as we have every facility for the work.

The Agricultural College is planning a summer course in agriculture extending over a period of three summers in order to equip teachers to teach agriculture in the high schools. Teachers holding first-class professional certificates will be admitted to train in this summer course.

We hope to be able to extend our work in agriculture in the high schools, and ultimately to make a certain amount of work in this subject obligatory through the arrangement suggested for training men to teach the work.

SASKATCHEWAN

BY A. W. COCKS, B.Sc., DIRECTOR OF SCHOOL AGRICULTURE

PROVISION has been made for the training of teachers for agricultural instruction in the Provincial Normal schools, the Agricultural College and the summer school for Teachers in elementary agriculture and science. A Director of School Agriculture has general charge of the work at each of the Normal schools, F. W. Bates, M.Sc., conducting the work at Saskatoon and A. W. Cocks, B.Sc., at Regina.

The work for the first and second class students in the Normal schools consists of nature study, school gardening, elementary agriculture and elementary science. At Saskatoon the professors of animal husbandry, field husbandry and natural history, together with Dean Rutherford of the College of Agriculture, give lectures to the Normal students on their special subjects. The Director of School Agriculture gives a series of lectures dealing with nature study methods, the place and practice of the school garden, and the general relationship of agricultural instruction in the schools to the other subjects of the curriculum. At Regina a similar course is undertaken by the Director of School Agriculture, who is assisted by the curator of the Provincial Natural History Museum and the Superintendent of the Dominion Experimental Farm at Indian Head.

Owing to the fact that the students

are not in attendance at the Normal School during the growing season, it is impossible to conduct very much practical school garden work. However, at Regina during the past summer a good garden has been cultivated by the pupils of the Model school. It serves to illustrate the methods and to provide suitable material for observation work for the Normal students. Arrangements are being made to establish a similar garden at the Normal school in Saskatoon.

No special certificates for agricultural instruction are given to teachers because of their Normal school work, but a diploma is awarded to those teachers who satisfactorily complete a two years' course at the summer school which is held every year at the University of Saskatchewan, Saskatoon.

The demand for well-qualified instructors in agriculture is gradually being felt in the province, and we hope that the University will, in time, be able to provide these teachers for our high schools and collegiate institutes. At the present moment there is a great shortage of well qualified men as most of the students of the University who would have been in a position to undertake this work are now engaged in military service with the Canadian Expeditionary Forces.

ALBERTA

BY D. S. MACKENZIE, DEPUTY MINISTER, DEPARTMENT OF EDUCATION

THE prominence which agriculture and its related industries should hold and will continue to hold in the province of Alberta is fully realized by the Department of Education, as is evi-

denced by the fact that provision is made in the educational scheme for courses of instruction along the lines indicated below:—

(a) Nature study in the elementary public school grades prepares the way

for Elementary Agriculture and School Gardening in the last two years of the public school course. In order to give definiteness to this course a suitable text has been prepared and this is supplied free by the Department to all pupils in Grades VII and VIII. To supplement this the Department has issued and supplied to teachers a bulletin dealing exhaustively with the subject matter and method of presentation.

(b) All high school students taking the teacher's course are required to take Botany, Zoology and Elementary Physical Science during the first two years of their high school course. This preparation is followed in Grade XI with a definite course in Scientific Agriculture, and this subject is a compulsory one in the final academic examination of all students seeking admission to the Normal schools for training as teachers

(c) The method of presenting instruction in Agriculture, as outlined above, constitutes part of the prescribed course in the training of teachers in the Normal schools. The instruction is given by teachers who have specialized in this branch.

(d) A summer school for teachers, extending over five weeks, is conducted each year by the Department of Education with the co-operation of the Department of Agriculture, at the University of Alberta, at which Agriculture, Nature Study and Gardening are among

the subjects in which courses are offered. During the earlier years agriculture formed a compulsory subject in the summer school course. Courses in Agriculture have also been given for high school teachers and inspectors of schools. Teachers may obtain Elementary Specialists' certificates through these courses.

(e) Special grants are paid by the Department to all school boards providing approved equipment and upkeep of school gardens, as well as special annual grants to teachers who have specialized for this work and have actually supervised satisfactory school gardens.

(f) In the autumn school fairs are held in various parts of the province. These are conducted through the co-operation of the Departments of Education and Agriculture and do much to stimulate healthful competition among the pupils of the surrounding districts in practically all branches of agricultural enterprise.

(g) The Department of Agriculture conducts a number of demonstration farms in various parts of the province, and in connection with three of these Schools of Agriculture are conducted in which young men and women are given the advantage of both scientific and practical training of such a character as to insure to themselves and to the province at large greater efficiency in farming operations, happier rural conditions and enhanced profits.

BRITISH COLUMBIA

BY J. W. GIBSON, M.A., DIRECTOR OF ELEMENTARY AGRICULTURAL EDUCATION

IN British Columbia there are two Normal schools and no Model schools. Both Normal schools give preliminary courses of four months' duration for the preparation of third-class teachers and also courses extending throughout the school year, approximately nine months, for the preparation of second-class

teachers. A course in nature study and elementary agriculture is given in each Normal school. One man in each training school takes charge of the work in agricultural instruction.

THE AGRICULTURAL CURRICULUM

Up to the present no formal curriculum in agricultural studies

has been adopted. The instructors have given most attention to the preparing of teachers in training to teach the subject as outlined in the course of study for public schools. At the present time a new and tentative course in nature study, school gardening and elementary science is being tried out in the Normal schools. It includes the following topics:

AUTUMN STUDIES

Type studies of trees, shrubs and vines of the district; additional work in the identification of the same. Similar studies with weeds, grasses and wild flowers of the district, special attention being given to those weeds mentioned in the "Noxious Weeds Act of British Columbia." Students to make collections in connection with these studies.

Type studies including life histories of a few common insects. Identification of main orders, illustrated lectures—emphasis placed on the economic side, insecticides for chewing and sucking insects.

Bird study—illustrated lectures, direct study of museum specimens for purposes of identification; adaptation of form, colour and habits to environment; methods of study to be followed; a few type lessons.

Observational study of fish with type lesson; identification of the food fishes of British Columbia; fish industry.

Domestic animals and pets; visits to dairy farms and poultry yards and live stock exhibitions where possible; some knowledge of the most important breeds and their uses.

WINTER STUDIES.

Soil studies—origin and classification studied directly out of doors and in the laboratory. Water, air and bacteria in the soil in relation to cultivation and the growing of crops.

Chief foodstuffs and their constituents; special study of milk as an article of food—the milk supply with methods of handling and treating; relationship to disease.

Special study of water—origin, chemical and hygienic impurities, natural and artificial methods of purification.

Study of air and weather conditions—combustion, pure versus impure air, heating and ventilation; transfer of heat; air pressure; simple instruments in daily use—thermometer, barometer, pump, hygrometer and rain gauge, weather records and the interpretation of weather maps.

SPRING STUDIES

School gardening and elementary horticulture. Regulations of the Department of Education with reference to school and home gardening. Discussion of methods and equipment; practical work in laying out, preparing and planting school gardens; window gardens; choice of varieties suitable to various conditions; propagation of plants—natural and artificial methods; germination and growth of plants; plant foods and fertilizers; spray mixtures.

Suggestions for correlation of the above studies with art, literature, geography, arithmetic and composition made in connection with each topic.

THE PART PLAYED BY THE SCHOOL GARDEN

The school garden is intended to play an important part in our system of teaching nature study and elementary agriculture. The teachers in training actually do the work and find it interesting and profitable. It aids very much in the study of soils and plant life, and, to some extent, in the study of insects. Since the opening of the Victoria Normal school two years ago a practice garden for teachers in training and for pupils in the Model school grades associated has been in operation, and this year preparations are under way for the establishing of a large school garden in connection with the Vancouver Normal school.

REQUIREMENTS FOR CERTIFICATES

Up to the present time, teachers in training at Normal schools are granted their teachers' certificate, without any definite requirements as to their knowledge of agriculture. Special qualifications in Rural Science or Agriculture are given only to teachers who attend summer school—a Rural Science certificate to those who complete the first year summer course and a diploma to those who complete the second year. These special qualifications entitle teachers to certain bonus grants as teachers of Rural Science.

SUMMER SCHOOL FOR TEACHERS

PRINCE EDWARD ISLAND

BY PROF. S. B. MCCREADY

THE summer school held this year was the fourth consecutive teachers' summer school held in Prince Edward Island, and the third school supported by the funds made available under THE DOMINION AGRICULTURAL INSTRUCTION ACT. As formerly the school was held at Prince of Wales College.

The school was carried out in conjunction with a Rural Life conference that occupied two days of the first week, and a meeting of the Prince Edward Island Teachers' Association which was held the last two days of the last week. Owing to this, there were only seven days in the two weeks in which systematic instruction was given to the first separate divisions into which the 250 teachers were grouped.

The Rural Life conference, an account of which appears on page 834 of the September GAZETTE, was considered part of the Summer School, and teachers required to summarize the addresses in their Rural Science note-books. Throughout the conference, the need for a new kind of teaching on the part of the rural schools and the call for leadership from rural teachers, were repeatedly emphasized by the speakers. It was clearly shown that the best hopes for off-setting the serious drain from the country that has been very marked here for a long time and building up a strong stay-at-home-and-develop-Prince-Edward-Island sentiment, lay in the work of the rural schools.

And there is good reason to believe that many of the teachers felt the force of the appeal to their loyalty. At the close of the con-

ference each teacher in training was asked to submit a brief summary showing, (1) the gist of the conference and (2) what it meant to him or her as a teacher. A few answers typical of those given by earnest teachers will indicate the new point of view and the high resolve resulting:

"I consider that the gist of the Rural Life conference has been to show us as teachers, preachers, inspectors, and rate-payers, the value of co-operation; to show us the high place the farmer takes in our lives; the need of education for his children; the value of scientific farming, and of consolidated schools; to inspire us to do better work for the rural schools of Prince Edward Island in training the children to love their country homes, and to give them a realization of the dignity of farming."

"The Rural Life conference has inspired me with a greater love for my work; has given me insight into the teaching of Nature Study, and has shown me the greater results that come from co-operation."—(F. M. Mc.)

"The gist of the Rural Life conference was that people, and more specially the farmers, should co-operate more in their work, each individual working for the good of his fellowmen rather than merely for his own selfish gain, whether mentally, morally or economically; that the clergymen and teachers should become better acquainted with and more interested in the people among whom they live and labour."

"To me as a teacher the Rural Life conference has meant that I shall try to put into practice some, if not all, of the good ideas learned, and so make myself more useful to the community in which I may reside."

"I think that the gist of this great conference may be expressed in a few words as follows: It has had a very good social effect; has pointed out the way in which the people of rural districts may be benefited by organization, co-operation and a more practical education; it has brought the people of the province more in touch with those of the other provinces along these lines."

"What it has done for myself as a teacher, it has given me confidence in my work and courage to go on with it, knowing as I now do, that I am in line with the work of other teachers all over Canada. I am now better fitted for the work I am expected to do in the country school, and am pleased to feel that the present small salary of teachers may be increased before long. Indeed I may state that it has given me new life, greater enthusiasm, much courage, and a higher appreciation of my calling."—(J. D.)

"The gist of the Rural Life conference is that it makes an epoch in the history of our school system from which many improvements will be introduced."

"To me as a teacher it does not mean much apart from the fact that I can derive a certain amount of gratification in knowing that others will reap the benefit of it, as I am getting pretty near the end of my work, being in my 70th year."—(J. L.)

For the regular class instruction the teachers were grouped in five divisions and taught by the following: Mr. J. E. McLarty in Elementary Agriculture, Mr. L. W. Watson in Nature Study, Mr. J. D. Seaman in School Management, Miss Hackett and Mr. P. Barlow in Drawing, and Mr. J. D. Fuller in Methods. In addition two periods were taken each day by the writer to discuss ways and means of advancing rural education in general. Amongst other topics the following were taken up and definite instructions given for the guidance of teachers: how to establish a school library; how to lay out and improve school grounds; how to make school gardens effect agricultural advancement in a rural community; how to join up the school with the Experimental Farm at Charlottetown; how to organize a School Progress club; how to co-operate with the Provincial Department of Agriculture by reporting live stock and crop statistics; how to train pupils to use the Dominion Department of Agriculture, use its bulletins, etc.; how to use farmers and members of Women's Institutes in helping in

the Rural Science teaching; how to conduct school fairs; how to supervise children's home gardening; how to train pupils to keep Rural Science records; how to teach Nature Study and Elementary Agriculture.

The subjects of singing and play were specially stressed this year. Messrs. Fuller and Barlow led the class in singing and several good songs suitable for school children were learned. From this it is hoped there may be awakened a new interest in music amongst the rising generation. As a feeder of the patriotic spirit, of a good school spirit, and of the co-operative spirit, class singing has a large service to perform.

There was a gratifying interest developed in the matter of play also. From 3 o'clock until 6 o'clock nearly every afternoon, groups were to be seen about the grounds busy learning and practising. Special attention was given to baseball (played with an indoor baseball), volley ball, ring ball and punch ball, as games suitable for rural schools. The Prince of Wales College grounds had been re-arranged so that there was accommodation for five separate groups to play at the same time. On Thursday afternoon of the last week a "Play Demonstration" or "Field Day" was held on the College campus. A good programme of games, races and singing, was carried out and a collection of over \$30 secured for the Patriotic and Red Cross funds. From this summer school activity it is hoped more attention may be given to supervise play by teachers in the country schools. For the "team-play" that our future farmers must practise there is no training so rich in possibilities as school games of the right sort. Supervised play is a very important part of an all around scheme of Rural Science instruction.

NEW BRUNSWICK

BY R. P. STEEVES, M.A., DIRECTOR OF ELEMENTARY AGRICULTURAL EDUCATION

PROMPTLY at 9.30 o'clock on Wednesday morning July 5th work began in our two schools at Woodstock and Sussex. Students had already enrolled and instructors were in their rooms; no time was lost. Dr. H. E. Bigelow, Instructor in Soil Physics and Chemistry, was in charge at Woodstock during the absence of the director, who at both schools gave lectures on the methods and plans to be followed in carrying on Nature Study and agricultural instruction in the common schools.

The enrolment was as follows:—

	Men	Women	Total
At Woodstock	9	33	42
At Sussex.	12	69	81

This enrolment represents about one-seventeenth of all the teachers in the province. Many men who had intended to attend felt it their duty to enlist in the army, many women felt it their duty to remain at home as fathers or brothers had gone,

or were going overseas.

According to our plans small classes are desirable; individual work is necessary. It is by doing rather than by hearing alone that we learn how and what to observe and teach. Most favourable conditions existed for excellent work and we believe that the records of both schools abundantly prove that this year's work has been most successful.

The classification of students was as follows:—

	Men	Women	Total
Second Year Students at Woodstock	4	5	9
First Year Students at Woodstock. . .	5	28	33
Second year students at Sussex . . .	5	25	30
First year students at Sussex.	7	44	51

The time table for class work in both schools is appended. Class A includes those of the 2nd, and Classes B and C first year.

TIME TABLE FOR RURAL SCIENCE SCHOOLS.

1916

	8:30-9:30	9:40-10:40	11-12	2-3:10
Mon.	A F. Mec., Dom. Sc. Plants		Animals	Soil
	B Plants	Animals	Soil.	Mec. & Scale Draw
	C Animals	Soil	Plants	Dom. Sc.
Tues.	A F. Mec.; Dom. Sc. Plants		Animals	Soil.
	B Soil.	Animals	F. Mec.; Dom. Sc.	Plants
	C Plants	Soil	Method	Animals
Wed.	A Mec. & Scale Draw. Soil		F. Mec.; Dom. Sc. Plants	
	B Method	Plants	Soil	Animals
	C Soil	Animals	Plants	Dom. Sc.
Thurs.	A Animals	Method	Soil	Plants
	B F. Mec., Dom. Sc.	Animals	Plants	Soil
	C Soil	Plants	Forests & Woods	Animals
Fri.	A Plants	Animals	F. Mec.; Dom. Sc. Soil	
	B Soil	Method	Animals	Forest & Woods
	C Mec. & Scale Draw. Dom. Sc.		Method	Animals
Sat.	A Animals	Forests & Woods		
	B F. Mec. & Dom. Sc. Plants			
	C Plants	Soil		

All students were required to take all the work laid down, and to be in regular attendance in order to be officially recognized

Much class work was conducted in the open air. Both work and play were entered into by all with spirit and enthusiasm. Early in the session the students met and elected committees; 1st, to direct entertainments and games; and, 2nd, to report proceedings at the schools to the newspapers and publish a Rural Science bulletin.

At Sussex on the military drill ground near the school an afternoon and evening were devoted to games and sport and social enjoyment. Refreshments were served under the direction of Miss Peacock, Instructor in Rural Domestic Science. At Woodstock a similar feature was carried out at the park on the river, the refreshment programme being under Mrs. J. Tye, Instructor in Rural Domestic Science.

Evening entertainments were also held in the assembly hall at one of which Mr. Wm. McIntosh, Instructor in Animal Life, greatly delighted those present by an excellent illustrated address.

Mr. Kilpatrick's addresses were also a feature of the session. His school garden pictures were to many a revelation of what can be done by children in cities even under unfavourable auspices where competent leadership and supervision are provided.

The schools at Woodstock and Sussex united as one in the publication of a Rural Science bulletin. The students liberally contributed in this effort both in subject matter and by subscription. The result is a highly creditable production.

A feature of this year's school was the substitution of oral for written tests in final examination. Heretofore attendance at class work, attention, success in experimental work, voluntary research work, were estimated from 66 as a possible mark and

a written examination at close of the session counted 34. This year an oral test of a practical character by each instructor was estimated from a possible 34. The plan has proved to be generally satisfactory.

Division I ranks from 80-100, Division II from 70-80, Division III from 60-70; no pupil in any subject to fall below 50.

The results of tests on the basis given above were as follows:--

	Div. I.	Div. II.	Div. III.
At Woodstock (2nd yr.)	5	4	
At Sussex (2nd yr.)	16	11	2
At Woodstock (1st yr.)	14	16	
At Sussex (1st yr.)	34	15	

To those who satisfactorily completed the second year's course and who have handed in pass work on the winter reading and experimental course, to be carried on during the interim between the first and second year, a certificate of competency in Nature Study and Elementary Agriculture is granted.

Appropriate closing exercises were held on the evening of Monday, July 31st, at Woodstock and Sussex.

On Tuesday, August 1st, class work and oral examination were resumed. The students were required to assist in putting apparatus, tools and other equipment in good condition and in proper places for future use.

The following is a statement of the winter reading and experimental course for the Rural Science school students.

WINTER READING

1. To read at least one book dealing with School Gardening and Agriculture of the standard of the following:--

- (a) "Agriculture for Beginners" (revised edition) by Burkett, Stevens & Hill. Published by Ginn & Co., Boston. Price 80
- (b) "The Beginner's Garden Book" by Allen French. Price \$1.00
- (c) "Beginnings in Agriculture" by A. R. Mann. Price 75

(d) "The Principles of Agriculture" by C. A. Stebbins. Price, \$1 00

(e) "Soils and Plant Life" by Cunningham & Lancelot. Price, \$1 10

Where students do not have any of the above named books and have others of similar standard of merit, by submitting the book of their choice for approval consent may be secured to use such selection.

EXPERIMENTAL WORK

2. A tabular statement showing results of physical tests of soils.

3. A record of winter observations made; of (a) Climate, (b) Birds, (c) Insects, (d) Other Animals, (e) Industries.

4. A physical map of the district showing so far as possible (a) Hills, (b) Wooded Sections, (c) Cultivated Land, (d) Streams, (e) Roads and Bridges.

5. A tabular list of trees in the district.

6. A tabular list of (a) Wild Plants, (b) Weeds, (c) Cultivated Plants in the district.

7. A concise account of experimental science work carried out in the school during the year.

All the experimental work is to have definite and particular reference to the district in which the teacher is engaged.

NOTE.—The various sub-sections of paragraph 3 above to be taken up as far as possible according to the following plan for the Domestic Animal part of sub-section (d) Domestic Animals,—various breeds distinguished adaptation of each breed to locality, relative value, local and provincial. (See Provincial and Dominion Agricultural Reports.)

All statements, lists, records and accounts named above to be made only after regular and systematic study, observation and research in the district where teacher works.

Work to be submitted not later than first day's attendance at second Session of Rural Science School.

ONTARIO

BY J. B. DANDENO, Ph.D., INSPECTOR OF ELEMENTARY AGRICULTURAL CLASSES

THE courses for public school teachers were organized in 1911, and those for high school teachers in 1913. Each of these two-year courses consists of two parts covered in consecutive years, and each session of the two-year course extends through a period of five weeks. The classes are carried on at the Ontario Agricultural College, under the control and direction of the Department of Education.

AIMS

The chief aim is to prepare teachers to give instruction in Elementary Agriculture in the schools of Ontario. Our system of education in Ontario has been, for several years, undergoing important changes, not only in subject matter, but also in method and in view point. Book study has its place, but its place is not the whole field. The introduction of Natural Science into the schools has had much to do with the change in method, and it has had something to

do also with the changed attitude toward the actual subject matter. When so many people are directly and indirectly concerned with agriculture, in one way or another, it is reasonable to suppose that a system of education in any country would not be complete without a place for agriculture. It may be a slow process to engraft the subject permanently into the curriculum of the schools of Ontario, but it is the aim of the Department of Education to do so.

SCHOOL GARDENS

In order to make the instruction effective, it is necessary to give pupils some practical exercises, and demonstrations to illustrate the principles involved. The school garden can be used with advantage for this purpose and it is expected that a properly managed school garden will take the place, to some extent, of a sort of laboratory, contributing to the advancement of the class instruction.

At the College, during the first year of the elementary classes, instruction and practice are given in this subject. The gardens of the Macdonald School are made use of under an arrangement with the trustees of the school and the Horticultural Department of the College. This arrangement provides practice in attending a garden which has had a good start as well as practice in planting a garden.

It is expected that, when teachers receive this training, they will manage gardens in their own schools. From year to year the number of schools is increased, and it is to be

The high school teachers are, for the most part, science specialists and well qualified to profit to the utmost by the instruction they receive in agriculture. They are all trained teachers and know how to make the most of the time and opportunity.

Owing to the fact that, at present, the subject has no standing as a matriculation subject, and is not required in the high schools, its introduction will necessarily be very slow. There is no valid reason why agriculture should not have consideration in the same way as other subjects on the examination scheme.



APPEARANCE OF THE SCHOOL GARDEN AT THE COMMENCEMENT OF THE O. A. C. SUMMER COURSE FOR TEACHERS, JULY 4TH, 1916

hoped that eventually all the public schools will be equipped with some sort of a garden.

HIGH SCHOOLS

The courses of training are necessarily short, but, as time goes on, and the subject is taken regularly in the high school, these short courses can become much more effective, for the work can then be more advanced, and the standard raised. At the present time, there are about five hundred pupils taking the work in the high schools, and the number is rapidly increasing.

OUTDOOR EXERCISES

It very frequently happens that teachers, especially female teachers, fail in health and soon wear out. This is, doubtless, due in part to the indoor life which they live, and to the ordinary worry of school discipline and school work. Realizing this, provision is made during the summer courses at the O.A.C. for regular outdoor sports. This is easily worked out here because practically all the students board and room on the campus, and it is a simple matter for the students to assemble for out-door games every

evening. I am convinced that the health of the summer school students is improved during these five weeks, notwithstanding the fact that serious study is carried on at the same time. But the chief advantage of this feature of the course is in the results produced on both teachers and pupils after the teacher returns to the school. New games are learned and played, and the teachers have a splendid opportunity to become acquainted with one another. In all my experience, I have seen no place so well suited to a work of this kind as the O.A.C.

During the course two interesting evening addresses were given to the students, one by Dr. Mills, former president of the College, and the other by Mr. Saunders, a bird student of London, Ont. Both these addresses were thoroughly enjoyed and appreciated by the students. Dr. Mills called attention in his address to three somewhat neglected phases of public school education, manners, slang and lack of respect for older folk.

One afternoon was used entirely for games and sports as a sort of Field Day, and this is no unimportant feature of the regular work.



APPEARANCE OF THE SAME GARDEN AT THE CLOSE—FIVE WEEKS LATER—AUGUST 16th, 1916
Only One Shower had Fallen During this Period

SUMMARY OF THE ATTENDANCE

	Elementary				Intermediate				Total
	Part I		Part II		Part I		Part II		
	M	W	M	W	M	W	M	W	
1911	8	75	1	16	..	..	..	..	100
1912.	16	65	2	23	..	..	..	..	106
1913.	14	64	5	36	23	4	..	..	146
1914.....	8	55	5	27	13	4	14	..	126
1915.....	15	39	5	18	17	1	9	1	105
1916.....	11	99	9	31	15	3	14	1	183

SASKATCHEWAN

BY A. W. COCKS, B.Sc., DIRECTOR OF SCHOOL AGRICULTURE

THE summer school for teachers conducted at the University of Saskatchewan from July 3rd to July 29th was attended by about 130 teachers.

The return railway fare of all who satisfactorily completed a course was paid by the Department of Education out of funds provided by THE AGRICULTURAL INSTRUCTION ACT. The students were provided with accommodation in the university

residence as in previous years at the rate of \$1.00 per day.

On the last day of the school the students, staff and a few friends partook of a banquet provided in the university dining hall and listened to interesting addresses by Dean Rutherford, the chairman of the directors, Prof. Hogg, and others.

The following is a statement of the attendance at the various courses:

First Year Course in Agriculture and Elementary Science	12	16	28
Second Year Course in Agriculture and Elementary Science	3	8	11
First Year Course in Household Science		16	16
Second Year Course in Household Science		7	7
Course in Physical Training	19	21	40
Special Course in Agriculture and Science	43	16	59

CONFERENCE FOR RURAL LEADERSHIP AT EDMONTON

AN important gathering in relation to rural interests was held at the Alberta Provincial University, Edmonton South, from August 7-11. The meeting was called a conference for rural leadership and was held under the auspices of the Extension Department of the University. It was in effect a school of instruction in agriculture for rural clergymen, but the audience included many from the country as well as from the Agricultural Department, Education Department, the University and citizens interested in rural betterment. Mr. J. S. Woodsworth, Director of the Bureau of Social Research for Alberta, Saskatchewan and Manitoba took an active part in the proceedings. The programme included the whole range of rural interests, social, educational and industrial.

Hon. Duncan Marshall, Minister of Agriculture, spoke on the subject

of developing an agriculture that would be desirable from the standpoint of business, attractiveness of occupation and satisfying as a general mode of life. Hon. J. R. Boyle, Minister of Education, gave a sketch of the work of the Department of Education in relation to rural schools, in the matter of liberal grants, the encouragement of agriculture and school gardening and the progress of consolidation. Dean Howes of the College of Agriculture also spoke on consolidation as well as on the production of field crops in Alberta. H. A. Craig, Deputy Minister of Agriculture, presented a comprehensive study of the conditions, problems and means of improvement in the marketing of farm products. H. W. Wood, President of the United Farmers of Alberta, spoke on the farmers' movement and Mrs. W. Parly on the work of the Women's Branch

PART IV

Special Contributions, Reports of Agricultural Organizations, Notes and Publications

SOCIETIES AND ASSOCIATIONS

THE QUEBEC POMOLOGICAL AND FRUIT GROWING SOCIETY

THE annual summer meeting of the Pomological and Fruit Growing Society of the Province of Quebec, was held at the Oka Agricultural Institute, La Trappe, Que., on September 7th and 8th, 1916. The programme of the convention was as follows:

President's Address: Professor W. Lockhead, Macdonald College.

Address of Welcome: Abbot Dom Pacome Gaboury, La Trappe.

Some of the pioneer apple growers of the province of Quebec: Robert Brodie, Montreal.

Pear Culture in Eastern Quebec: J. C. Chapuis, St. Denis.

Small Fruits, packing and packages: C. W. Baxter, Fruit Branch, Ottawa.

Co-operation: Rev. Father Bellemere, Montreal.

Preserving Fruits: Rev. Father Athénase, La Trappe.

Some of the important items of fruit culture: Rev. Father Leopold, La Trappe.

McIntosh and Fameuse—money makers: Professor T. G. Bunting, Macdonald College.

A resolution adopted following the address of Mr. Baxter was to the effect that

"Whereas the small fruit growers of this province use a large and cumbersome crate, holding 54 boxes, greatly to their disadvantage, also because of the poor shipping qualities, it is resolved that the Fruit Division of the province be asked to issue a pamphlet to this effect to the growers and explaining the advantages of the light 27-box crate."

Particular interest was evinced in and much discussion followed the address of Professor Bunting, who made the statement during the course of his remarks, that the only two varieties of apples to which the fruit growers of this province should devote attention were the McIntosh and Fameuse. Many of the delegates who took part in the discussion agreed with Professor Bunting, and as a means of furthering this object particularly, and the interests of the fruit growing industry generally, the executive of the society was appointed as a special committee to confer with the Quebec Department of Agriculture, the idea being to take up the whole question of the present status of fruit growing in the province, with a view to undertaking an educational campaign among the growers. The committee will report at the society's annual meeting, which will be held at Macdonald College in December.

THE DAIRYMEN'S ASSOCIATION OF EASTERN ONTARIO

The programme for the winter dairy exhibition of the Dairymen's Association of Eastern Ontario, to be held at Napanee, Ont., on January 4th and 5th, 1917, has been issued. It calls for five classes—September cheese, October cheese, flat and

Stilton cheese, September make, creamery butter, November make, and dairy butter, December make—and \$518 is offered in prizes by the association. A number of special prizes are to be competed for.

THE SASKATCHEWAN LIVE STOCK CONVENTION

The annual meetings of the various Saskatchewan Breeders' Associations, which are to take the form of a "Live Stock Rally," to be known as the "Saskatchewan Live Stock Convention" will be held from January 9-12, inclusive. The convention will be held at the College of Agriculture in Saskatoon, thus assuring it splendid accommodation for lectures, discussions and demonstrations. No trouble and expense will be spared by the committee

in charge to arrange for the best known and most prominent authorities on live stock matters to address the conference and to lead discussions, which are of interest to Saskatchewan breeders. The problems of the breeder, live stock sanitation, contagious abortion, tuberculosis amongst cattle feeding and marketing and economic conditions affecting this our most basic industry will find a place on the programme.

THE ALBERTA LIVE STOCK ASSOCIATIONS

SUPPLIED BY E. L. RICHARDSON, SECRETARY

The scope of the operations of the Alberta Live Stock Associations, Calgary, is gradually being widened. The associations have in the past held annual spring horse and cattle shows and sales in April, an auction sale of cattle at Lacombe in June, a wool sale in August, and a Fat Stock Show in the middle of December. This year the Alberta Cattle, Sheep and Swine Breeders' Associations are inaugurating an auction

sale of dairy cattle, sheep and swine, to be held at Calgary from the 17th to the 19th of October. The Calgary Soil Products Exhibition will be held at the same time, and will include vegetables, grains, and fruit.

The Alberta Cattle Breeders' Association will also hold an auction sale of purebred beef females and stock entered in the fat stock show classes at their fat stock show next December.

NEW PUBLICATIONS

THE PROVINCIAL DEPARTMENTS OF AGRICULTURE

QUEBEC

The Protection of Plants from Insects and Fungous Diseases.—The eighth annual report of the Quebec Society for this purpose makes a book, with numerous illustrations, of 110 pages. Besides the usual lists of officers and members, a number of valuable and instructive addresses are included in the report by professors of Macdonald College, the Oka Agricultural Institute, Dr. Robert Matheson, of Cornell University, Mr. Arthur Gibson, Chief Assistant Entomologist, Department of Agriculture, Ottawa, Mr. W. A. McCubbin, of the Dominion Field Laboratory of Plant Pathology, St. Catharines, Ont., and others.

Circular No. 18 published by the School Garden Section of the Division of Horticulture in the Quebec Department of Agriculture, of which Jean Charles Magnan, B.S.A., has charge, deals in detail with the subject of the Agricultural School Museum. For further information see page 886 of this number.

Circular No. 19 published by the same division deals with the Agricultural School Fair. This circular is suitably illustrated and concludes with a number of extracts

from the reports of the school fairs held in 1915.

Both of these circulars are printed in the French language.

ONTARIO

Autumn Sown Crops.—In a four-page leaflet closely printed and crowded with facts and figures, Dr. C. A. Zavitz, Professor of Field Husbandry at the Ontario Agricultural College, details the results of experiments conducted at the College and on various farms in different parts of Ontario. The crops experimented with were winter wheat, winter rye, winter barley, winter emmer and hairy vetches. The experiments cover various periods extending from five to over twenty years. The extent of the experiments is suggested by the fact that about two hundred and ninety varieties of winter wheat and a large number of selections and crosses were grown at the Agricultural College during the past 27 years, and that in the past year alone, 352 farmers throughout Ontario conducted experiments with autumn sown crops.

Joint-Ill in Foals.—The second report on the investigation into joint-ill in foals existing in the province of Ontario by F. W. Schofield, D.V.Sc., Department of Bacteriology, Ontario Veterinary College, makes

a pamphlet of 24 pages. In sending on this additional report Mr. Schofield states that extensive experiments were carried on during the summer of 1915 in connection with this disease, and that, although these experiments were not uniformly successful, he is confident that the methods advocated in the report, if properly employed, will greatly reduce the mortality of the disease. One of the most interesting facts brought to light by this investigation Mr. Schofield points out, is the presence of similar organisms in the milk of the dam as are found in the diseased joints of the foal. The exact significance of this will only be ascertained by further experiments. Full details are given in the pamphlet of experiments and results, by districts and in the aggregate, with illustrations, along with descriptions of the trouble and methods of treatment, one of the conclusions being that better results are obtained from the use of vaccines than from any other method of treatment of joint-ill.

The Agricultural Societies of Ontario: sixteenth annual report, being for the year 1915-16. A verbatim report of the annual convention of the Ontario Association of Fairs and Exhibitions, held at Toronto, Feb. 1st and 2nd, is given, accompanied by a statement from the Superintendent that the several hundred exhibitions held in the province last autumn were record-breakers, both in the attendance and in the quality of the exhibits. The formation of 57 new agricultural societies in Northern Ontario is recorded. Full details of grants to societies, to school fairs, for crop, live stock and other competitions are supplied as well as an analysis of the moneys paid out in prizes by the different societies, the totals for horses being \$84,323.43, for cattle \$53,323.45, for sheep \$23,354.76, for swine \$15,337.83, for miscellaneous \$118,010.53, making a grand total of \$294,350. Toronto heads the list with \$37,550.10 paid out, Ottawa comes second with \$19,765.44 and London third with \$18,517. Particulars of the receipts and expenditures of all the societies are furnished. A plentiful number of illustrations embellish the work, which takes 120 pages.

Report of the Minister of Agriculture, for the year ending October 31st, 1915.—While containing a review of the usual activities and industries of the Department, a good deal of the space of this 80-page report is devoted to school fairs, demonstration work, crop and live stock competition results, war philanthropies and the proceedings of Women's Institutes. Statistics regarding the Ontario Agricultural College show that 1,652 students of all classes attended in 1915, including 559 for the general course, 390 for domestic science, 449 for special courses in agriculture and 254 for teachers, inspectors and rural leader-

ship courses. The report bears direct testimony to the "splendid work" accomplished by means of the grant of \$266,012.64 under THE AGRICULTURAL INSTRUCTION ACT. It also shows that produce to the value of \$839,077.62 was sent over seas for distribution among the military hospitals, civilian sufferers, and the navy, the goods including 250,000 bags of flour, 200,000 lb. of evaporated apples, 1,378 bags of raw beans and 108,000 cans of baked beans, 27,000 tins of canned corn, 28,000 tins of canned peas, 10,000 boxes of apples and 20,000 gallon tins of preserved peaches. A considerable quantity was consigned to Belgium. Complete reviews of the operations of the different divisions and branches are given along with numerous illustrations.

The Forty-Sixth Annual Report of the Entomological Society of Ontario, 1915, contains the proceedings of the fifty-second annual meeting of the Society held in Ottawa on November 4th and 5th, 1915. It also includes the reports of the various officers and branches of the Society, together with the papers and addresses presented at the Convention. A detailed report of the Convention was published in THE AGRICULTURAL GAZETTE, Volume 2, December, 1915, page 1216.

MANITOBA

Hand Selection and Harvesting of the Seed Plot, by A. R. Judson, B.S.A., Field Husbandry Department. The profit following hand-selection of seed is pointed out and illustrated in this Extension Bulletin, No. 5, forming the August number of the Manitoba Farmers' Library, issued monthly under the auspices of the provincial Department of Agriculture. Mr. Judson quotes the success of Seager Wheeler of Saskatchewan with Marquis wheat as a substantial proof of the advantages of the hand selection method. He then describes desirable and undesirable types of grain, following with advice on how, when and where to make selection. Brief remarks on the preparation of next year's land conclude a bulletin of importance.

SASKATCHEWAN

The Co-operative Organization Branch Annual Report, 1915-16.—This 30-page report records the second year's operations of the Co-operative Organization Branch. In addition to outlining the work of the branch, details are given in regard to the number and activities of the associations registered under The Agricultural Co-operative Associations Act of the province and explains the objects of amendments to the Act passed at the last session of the Legislature. A summary of the work carried

on by the co-operative creameries, the Saskatchewan Co-operative Elevator Company, the Hail Insurance Commission, and the wholesale trading department of the Saskatchewan Grain Growers' Association during the period covered by the report is also included. In 1914 there were 113 associations working under the Act. At the date of the report, May 1, 1916, there were 261. The 173 associations that reported business done in 1915 had 5,537 shareholders and a paid-up capital of \$39,421.49. The assets amounted to \$105,322.37 and the liabilities to \$82,956.57. Ten associations shipped stock co-operatively, 140 car-loads bringing \$150,572.76. Two community breeding associations were registered in 1915-16 under the Act, one devoting itself to Clydesdale, and the other to Holsteins.

The ninth annual report of the Secretary of Statistics for the sixteen months ended April 30th, 1916, contains the final statistical report on grain crops, on live stock, grain marketing, immigration and population, along with meteorological data covering the period mentioned and a ten-year comparison of statistics relative to agriculture in Saskatchewan, the ten years representing the age of the province, which came into being on September 1st, 1905. A map is given showing the nine crop districts into which the province is divided.

BRITISH COLUMBIA

Butter-making on the Farm, Bulletin No. 71, by T. A. F. Wiancko, Provincial Dairy Instructor. Here is a 24-page bulletin written especially for farmers, in the hope that it may contain some suggestions and some ideas that will serve to improve the methods of the dairyman and increase his profits. It is undoubtedly true that, as the introduction says, incorrect methods, and sometimes carelessness, prevent the bulk of farm-made butter from bringing the price it should, thus entailing a loss on farmers which in the aggregate is of serious proportions. Defects in dairy butter are pointed out and the causes of undesirable flavours explained. Instructions, with illustrations, are then given on practically everything appertaining to the making of high class butter. While written especially for circulation in British Columbia there is naturally much in the bulletin of importance to every farmer in the country.

Care and Feeding of Dairy Cattle, Bulletin No. 67, by S. H. Hopkins, B.S.A., Assistant Live Stock Commissioner. Dairying in British Columbia, as in other Western provinces, is on the upper trend. As the bulletin says the most prosperous agricultural communities of the world, where

intelligent farming reaches its highest level, depend chiefly on dairying. There are many truths of a like character to be found in this bulletin of 64 pages that makes it particularly valuable and instructive. The relative value of different dairy breeds (Holstein-Friesian, Ayrshire, Jersey and Guernsey) is set forth and advice supplied on the choice of breed and care of both cow and bull. Types are illustrated. In short the bulletin is a comprehensive compendium of all that its title calls for. Diseases and troubles that cattle are subject to are described and remedies suggested. The treatment of cows during the calving period and care of the calves receive attention. Advice is given on the construction of barns with some clearly-drawn diagrams. Statistical tables at the end of the bulletin furnish in minute detail the value of all kinds of food, granular, vegetable and grass.

MISCELLANEOUS

The Canadian Annual Review, 1915, by J. Castell Hopkins, F.S.S., F.R.G.S.; Toronto, The Annual Review Publishing Co., Limited; 5¾ x 8¾ in.; 880 pages.

The fifteenth issue of *The Canadian National Review*, like its fourteen predecessors, is not only a work of very considerable magnitude, but is replete with historical facts concerning the Dominion and its partnership in the Empire and relationship with other countries, concisely, clearly and comprehensively reviewed. It also contains a photograph of the late Lord Kitchener as a frontispiece and forty-four portraits of men notable in the public life of this country, including eleven who made the supreme sacrifice on the battlefield during 1915 and nineteen officers in the Dominion forces. Upwards of 450 pages are devoted to matters concerning the world war, especially appertaining to the part played by the colonies. Military affairs naturally receive the greater part of attention, but the financial situation and the work and aims of the patriotic associations are reviewed. A chapter is given to the policy pursued, and the attitude assumed, by the United States in connection with the titanic struggle. The affairs of the various provinces, politically, educationally and materially, are reviewed. Transportation and Dominion political affairs receive their need of attention. This section of the book concludes with a narration of financial industrial, insurance and journalistic incidents in 1915, book reviews and a Canadian obituary for the year. The last 72 pages form a Canadian and United States financial supplement, in which detailed reference is made to bank and other reports and statements, and tables given of the assets and liabilities of the different institutions.

NOTES

The Ontario Agriculture and Experimental Union, through its secretary, Dr. C. A. Zavitz, of the Ontario Agricultural College, announces its co-operative experiments with winter crops. The experiments are as follows:

	Plots.
1. Testing three leading varieties winter wheat.....	3
2. Testing one leading variety of winter rye and one of winter wheat.....	2
3. Testing spring applications of five fertilizers with winter wheat.....	6
4. Testing autumn and spring applications of nitrate of soda and common salt with winter wheat.....	5
5. Testing winter emmer and winter barley.....	2
6. Testing hairy vetches and winter rye as fodder crops.....	2

Numerous co-operative implement societies are being formed in Great Britain. Such societies have been in operation in Ireland since 1912, but in England they are an entirely new departure and have been brought into being with a view to alleviating in some measure the scarcity of labour. The capital of each society is usually around a thousand pounds, or \$5000, divided into one pound shares. Five per cent is paid up and a bank called upon for an overdraft to the extent of the uncalled capital. A leaflet issued by the Board of Agriculture states that well-conducted societies will soon earn sufficient to pay for the initial cost of the implements. In many cases Irish societies commencing with two corn binders have in one harvest earned sufficient to purchase a potato digger. In its turn the potato digger has earned sufficient to buy a corn drill. By beginning in a small way like this a society's borrowing powers are automatically increased, and it is in a position to undertake the purchase of the more expensive implements, such as agricultural tractors with their complementary implements, combined threshers and finishers, and mole-draining plants.

At a meeting of the Crop Report Committee of the Ontario Bee-keepers' Association on September 8th, it was stated that 89 members had reported 91,325 pounds of honey from 5,091 colonies, being an average of 18 pounds per colony. The average is about the same as last year. Members of the association were advised by the committee to ask from 8½ cents to 9 cents per

pound wholesale. Buckwheat honey, it was suggested, should be held for 10 cents per pound. The honey crop was reported good and to be selling rapidly.

In several counties of England a system of short-courses for the training of women in farm work has been adopted. The course takes two weeks and the training consists of whatever work may be going on at the time, such as weeding corn, hoeing roots, milking, dairying generally, hay-making, etc. Students for dairying instruction are required to be at the dairy farm at 6 a.m., but the schedule for the general day runs like this: rising, 6 a.m.; breakfast, 7 a.m.; assemble for work, 7.45; start work, 8; dinner, 12 to 1; cease work 5 p.m.; meat tea, 5.45; bed time, 9; lights out, 9.30. Each student is required to pay 5 shillings per week toward the cost of board, lodging and instruction, and is paid 3 pence per hour for work accomplished. It is stated that the wages generally more than cover the board and lodging fee.

The Jewish Agricultural and Industrial Aid Society, of the United States, has announced its ninth annual competition for short-course scholarships. These scholarships are open to the children of Jewish farmers resident in any part of the United States. Since 1908, when the system was established, 137 scholarships have been awarded. While the greater number of students are from Connecticut, Massachusetts, New Jersey and New York, Pennsylvania, Ohio, Michigan, North Dakota and Wyoming have had representatives. It is stated that there is a noticeable improvement in the home farms of the scholarship winners. A scholarship carries with it all expenses while a student at the State Agricultural College. Money is placed in the hands of the college authorities, who make the necessary disbursements for board, room, books, fees, etc., the student's only outlay being for travelling. The scholarships are awarded by competition based on the writing of a composition in English of not more than 500 words on some agricultural topic that has come within the writer's own ken.

Since the first of April, 1916, Manitoba has exported 31 carloads of creamery butter. The cars each contained on the average 400 boxes, each box containing 56 lb., bringing the total butter exported to 700,000 lb.

INDEX TO PERIODICAL LITERATURE

The Canadian Countryman, Toronto, Ontario, September 2nd, 1916.

Caring for the Dairy Herd in Fall, Professor H. H. Dean, page 1132.

The Canadian Poultry Review, 184 Adelaide St. W., Toronto, September, 1916.

The "Egg Case" Plan and its Use, J. H. Hare, B.S.A., Poultry Division, Live Stock Branch, Dominion Department of Agriculture, page 338.

Everywoman's World, Toronto, Ont., June, 1916.

The Community Spirit in Ayr, Ontario, page 7.

What the Women of Canada Want, Elizabeth Becker, page 7.

Farm and Ranch Review, Calgary, Alta., September 5th, 1916.

The Growing of Winter Rye, G. H. Cutler, Professor of Cereal Husbandry, University of Saskatchewan, page 656.

Farm and Dairy and Rural Home, Peterboro, Ontario, August 31st, 1916.

Cow Testing in British Columbia, T. A. Wiancko, Provincial Dairy Commissioner, page 873.

Farmers' Advocate and Home Journal, Winnipeg, Man., August 23rd, 1916.

The Marketing of our Wool Crop, W. H. J. Tisdale, Associate Professor of Animal Husbandry, University of Saskatchewan, page 1196.

The Farmers' Advocate, London, Ont., August 24th, 1916.

Some Cures for the Rural-School Problem, Sinclair Laird, Dean of the School for Teachers, Macdonald College, Que., page 1382.

The Value of Exhibitions to Cereal Husbandry, Dr. C. A. Zavitz, page 1431.

The Correct Age to Breed the Heifer, E. S. Archibald, Dominion Animal Husbandman, page 1436.

The Saturday Press and Prairie Farm, Saskatoon, Sask., September 2nd, 1916.

Co-Operation in Marketing of Produce, H. A. Craig, Deputy Minister of Agriculture for Alberta, page 11.

Killing and Dressing Pork, by A. M. Shaw, B.S.A., Professor of Animal Husbandry, University of Saskatchewan, page 3.

The Grain Growers' Guide, Winnipeg, Man., September 13th, 1916.

A Farmers' Packing Plant, E. A. Weir, B.S.A., page 1399.

The Agricultural Journal, Victoria, B.C., September, 1916.

Possibilities of the Sugar-beet Industry Grossly Exaggerated, H. O. English, Soil and Crop Instructor, page 104.

A Review of the Codling-moth Situation in British Columbia. Growers Must be on the Look-Out for Signs of this Pest when Harvesting Their Apples, R. C. Treherne, Field Officer, Entomological Branch, Dominion Department of Agriculture, page 109.

Apple Anthracnose is Worst Enemy of Coast Apple-Growers, J. W. Eastham, Plant Pathologist, page 111.

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DEPARTMENT OF AGRICULTURE

The Agricultural Gazette of Canada

EDITOR · J. B. SPENCER B.S.A

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CONTENTS

The Value of Instruction in Dairying	943
--	-----

PART I

DOMINION DEPARTMENT OF AGRICULTURE

The Dominion Experimental Farms:—	
Farmers' Field Days and Excursions	944
The Entomological Branch:—	
The Pear Thrips in British Columbia and its Control, by A. E. Cameron and R. C. Treherne	946
The Destructive Insect and Pest Act	952
The Dairy and Cold Storage Branch:—	
Transportation of Dairy Products, by W. W. Moore	953
The Fruit Branch:—	
The Apple Situation in Eastern Canada, by F. H. Grindley	954
The Live Stock Branch: —	
Conservation of Breeding and Feeding Cattle in the Western Provinces	955
The Seed Branch:—	
The Grading of Seed Grain	957

PART II

PROVINCIAL DEPARTMENTS OF AGRICULTURE

Agriculture in Canada: —	
Prince Edward Island, by W. R. Reek	958
Cheese Factory and Creamery Instruction and Inspection:—	
Prince Edward Island, by W. R. Reek	964
Nova Scotia, by W. A. MacKay	966
New Brunswick, by C. W. McDougall	971
Quebec, by Elie Bourbeau	972
Ontario, by G. A. Putnam	976
Manitoba, by J. W. Mitchell	980
Saskatchewan, by F. H. Auld	981
Alberta, by Jas. McCaig	983
British Columbia, by S. H. Hopkins	984
The Motor Car in District Representative Work:—	
Prince Edward Island, by Theodore Ross	986
Nova Scotia, by M. Cumming	986
Quebec, by F. N. Savoie	988
Ontario, by C. F. Bailey	988
Saskatchewan, by F. H. Auld	991
Nova Scotia:—	
Creameries Booth at the Provincial Exhibition, Halifax, by W. A. MacKay	993
Quebec:—	
Macdonald College:—	
Exhibit at Sherbrooke Fair, by Jas. Murray	995
- Sale of Pure-Bred Sheep and Swine, by H. Barton	997

Ontario:—	
Encouragement to Sheep Raising, by W. Bert Roadhouse.	998
Manitoba:—	
The Poultry Market Situation, by M. C. Herner	998
Exporting Feeders and Stockers	999
Agricultural College Appointments	1000
Saskatchewan:—	
Deputy Minister Mantle Killed in Action	1000
Activities of the Provincial Department of Agriculture	1000

PART III

RURAL SCIENCE

Agricultural High Schools:—	
Ontario, by J. B. Dandeno	1002
Manitoba, by H. W. Watson	1003
Saskatchewan:—	
Creelman S. D. No. 998, by F. C. Cousins	1004
Boys' and Girls' Contests	1005
Suggestions for Rural School Improvements	1006
Broadview Boys' Fair	1007

PART IV

SPECIAL CONTRIBUTIONS, REPORTS OF AGRICULTURAL ORGANIZATIONS, NOTES AND PUBLICATIONS

Farm Management Demonstrations in the United States, by E. A. Brown	1008
The Agricultural Development of Japan, by Wm. B. Varley	1013
Rural School Fairs in Ontario	1014
Boys' and Girls' Clubs in the United States	1016
School Garden at Ottawa	1016
Vocational Education in the United States	1016
Societies and Associations	1017
New Publications	1020
Notes	1024
Index to Periodical Literature	1026

The Agricultural Gazette

OF CANADA

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THE VALUE OF INSTRUCTION IN DAIRYING

THE development of the dairying industry in Canada and other countries affords an excellent illustration of the value of organized instruction. Until Denmark developed, through her co-operative organization, a system of uniform instruction in dairying, her butter secured no recognition except for its inferior quality. In 1860 the British Vice-consul at Copenhagen reported to his government that "butter, or what is sold under that name, is execrably bad." Denmark today supplies Great Britain with more butter than does any other country and at a higher average price per pound. The improvement commenced with the establishment of the dairy school at Copenhagen, where the experts for her nine hundred creameries are scientifically trained.

In Canada, as in Denmark, the making of butter and cheese made no material advance until the creamery and factory systems were introduced. These made possible a system of instruction that could reach the producer and maker. But a finger board pointing to the dark places was necessary and this was found in a plan of inspection. Inspection supported by the power of law associated with instruction where needed, is year by year raising the dairying industry to a condition nearer and nearer perfection. The result is shown on our Cheddar cheese, which has acquired a recognition in the British market similar to that enjoyed by the butter of Denmark. Canada's only formidable rival on the British cheese market is the Dominion of New Zealand, which enjoys a system of instruction and inspection similar to our own, which was remodelled and reorganized in that country by the present Dairy and Cold Storage Commissioner for Canada. Precisely how factory inspection and instruction are carried on throughout Canada, is told in this number by provincial officials. This series will interest officials concerned with the welfare of the dairying industry. It also contains lessons for those striving to improve the standing of other branches of husbandry.

PART I

Dominion Department of Agriculture

INFORMATION SUPPLIED BY OFFICIALS OF THE VARIOUS
BRANCHES REPRESENTED

THE DOMINION EXPERIMENTAL FARMS

FARMERS' FIELD DAYS AND EXCURSIONS

THE Experimental Farm system, in the effort to spread the knowledge of its work and increase the interest therein, follows a carefully-planned publicity campaign.

Of this campaign, a main feature is the holding of excursions or farmers' field days at the various Farms and Stations throughout the Dominion. These field days have much in common in whatever district they may be held, while, in addition, local problems and the special features to be observed at the several Farms lend to each occasion an interest peculiarly its own.

The following sketch of a farmers' field day held in August last at the Experimental Station, Fredericton, N.B., prepared by Mr. W. W. Hubbard, Superintendent, may serve to indicate broadly the main features of these gatherings throughout the Experimental Farm system.

By way of introducing the work of the Experimental Station at Fredericton to its members and visitors, the Farmers' and Dairy-men's Association of New Brunswick arranged, on the invitation of Superintendent Hubbard, for a meeting and excursion to the Station on August 23rd last.

Although only ordinary convention rates of return tickets for single fare were arranged the interest taken in the excursion was much keener than expected and an attendance of over 1,200 people, representative of nearly all sections of the province, resulted.

The excursionists began to arrive at 9 a.m. by train and automobile and continued coming by the various trains until noon. Those first to come began an immediate inspection of the farm crops and live stock. Luncheon, provided free by the Station, began at eleven a.m. in the dining hall, which seats over 200 people at one time. To provide for all who came, this service was continued till after 3 p.m. and over one thousand people enjoyed the home-cooked pork and beans, meats, vegetables, pies and cakes, taxing the commissariat to almost the limit, as the number expected was about six hundred.

The Director Mr. J. H. Grisdale, and the Dominion Animal Husbandman, Mr. E. S. Archibald, had arranged to visit the Station at the time set for the excursion, and Messrs. G. C. Cunningham, Dominion Plant Pathologist for New Brunswick and Quebec, and B. Leslie Emslie, Fertilizer Expert for

the Experimental Farm system, were also in attendance.

THE EXCURSIONISTS WELCOMED

At one-thirty p.m., all of the party not engaged in the lunch room gathered beneath the Union Jack floating over the grove and were called to order by Mr. George E. Fisher, President of the Farmers' and Dairymen's Association, who, after expressing his pleasure at the fine response to the call of the officers of the association, said they had assembled at the Experimental Sta-

and demonstration being carried on by the Experimental Farm system and by the provincial Department of Agriculture. Hon. J. A. Murray, provincial Minister of Agriculture, had expected to be present at this gathering, but had been unavoidably detained by other duties and he (the speaker) had been requested by Mr. Murray to present his regrets at his enforced absence, and to assure the farmers present that his Department was prepared to co-operate in every way with the association and to carry on a vigorous educational



FARMERS' EXCURSION TO EXPERIMENTAL STATION, FREDERICTON, N.B.

A number of the visitors are here listening to a live stock address and demonstration by Prof. E. S. Archibald, Dominion Animal Husbandman

tion at the invitation of Superintendent Hubbard, and he urged all present to take the fullest advantage of the lessons to be learned from the many lines of work being carried on. He urged the support of the farmers of the province to their association, which, if properly supported, was capable of doing a great work for the advancement of agriculture and could supplement and make effective the many lines of investigation

campaign.

Superintendent Hubbard welcomed the excursionists and hoped they would make the visit an annual event. He had not invited them in previous years as the work of the Farm was only now becoming sufficiently advanced to be interesting. Heretofore, clearing land, making roads and fences, and erecting buildings had been the main work, and, while much of this remained to be

done, some experimental work was now started and should become increasingly valuable from year to year.

THE FARM SYSTEM OUTLINED

Director Grisdale gave a forcible address, outlining some of the work which the Farm system, under his charge, was carrying on and pointing out how the practical farmer might take advantage of the various lines of effort. "Send us in your problems or bring them yourselves and if we cannot answer them off-hand we will put our whole staff at work to try and give solutions which will save you money and effort. It is our ambition to make the Experimental Farm system of personal value to every farmer in Canada," said Mr. Grisdale.

At the conclusion of the Director's address, Mr. E. S. Archibald gave a demonstration and talk with the various breeds of cattle to be found on the Station. This aroused such interest, and led to so much discussion, that it was nearly four o'clock before the crowd allowed Mr. Archibald to drop his subject.

POTATO DEMONSTRATION

Those who were especially interested in potato-growing went with

Mr. G. C. Cunningham to the potato fields, and discussed with him the various diseases to which potatoes are liable, and their treatment. Over one hundred different varieties and strains of varieties of potatoes were to be seen under test as well as a large number of plots under test with fertilizers. This branch of the work was explained by Mr. Emslie. In addition to the fertilizer work with potatoes, there were to be seen seventy-eight plots, each with different fertilizer treatment, undergoing a test of rotation of crops, viz.: potatoes, oats and clover; this year the crop on these plots was oats.

Seventy-five different varieties of corn, turnips, mangels, carrots and sugar beets were also to be seen under test as well as eighty cereal plots, forty grass and clover plots and an acre of flax, partly pulled, to be tested for the manufacture of linen.

The ladies of the party were chiefly interested in the garden and poultry departments. The flower beds were at their best and the poultry, consisting of pure-bred flocks of Rhode Island Reds, Barred Plymouth Rocks White Wyandottes and White Leghorns, numbering over one thousand birds, were certainly attractive.

THE ENTOMOLOGICAL BRANCH

THE PEAR THRIPS IN BRITISH COLUMBIA AND ITS CONTROL

BY A. E. CAMERON, M.A., D.Sc., AND R. C. TREHERNE, B. S. A., FIELD OFFICERS
ENTOMOLOGICAL BRANCH, DEPARTMENT OF AGRICULTURE, OTTAWA

THE discovery of this important pest (*Taeniothrips pyri* Dan.) in the orchards of Vancouver Island, has already formed the subject of a short article published by the Dominion Entomologist, Dr. C. Gordon Hewitt, last year in THE AGRICULTURAL GAZETTE of Canada.* In that article emphasis was laid on

the importance of the insect, and after the salient features of the life-history and the damage caused to the trees had been outlined in brief, the undertaking of immediate measures of control was advocated. Attention was drawn to the fact that in the infested counties adjacent to San Francisco Bay in California, this insect was responsible for an annual loss of over ten million dollars, and that prune orchards were most seriously affected. Such a

*Hewitt, C. Gordon—Two serious Fruit Pests new to Canada, THE AGRICULTURAL GAZETTE OF CANADA, Vol. 2, No. 8, Aug., 1915, p.p. 732-737.

figure provides in itself sufficient stimulus to arouse the orchardists to vigorous action wherever the thrips may be found.

The pear thrips is not confined to the Pacific Coast of the continent. In the year 1911, it made its appearance on the Atlantic seaboard in the state of New York, where it committed much damage in the orchards along the valley of the Hudson river. In 1912, it was recorded from Pennsylvania on pear blossoms and, in 1914, from the state of Maryland. It is doubtless safe to prophesy its

Both Europe and the Orient have been suggested, but the evidence seems to support the European theory most strongly. Recently, on June 20, 1916, in a letter which one of the authors received from Mr. C. B. Williams, previously of the John Innes Horticultural Institute, Merton, Surrey, England, and now of the Board of Agriculture, Trinidad, who has published extensively on British and American Thysanoptera, it is stated that the name *Taeniothrips pyri* Dan., must be replaced, as the species is found to be identical with

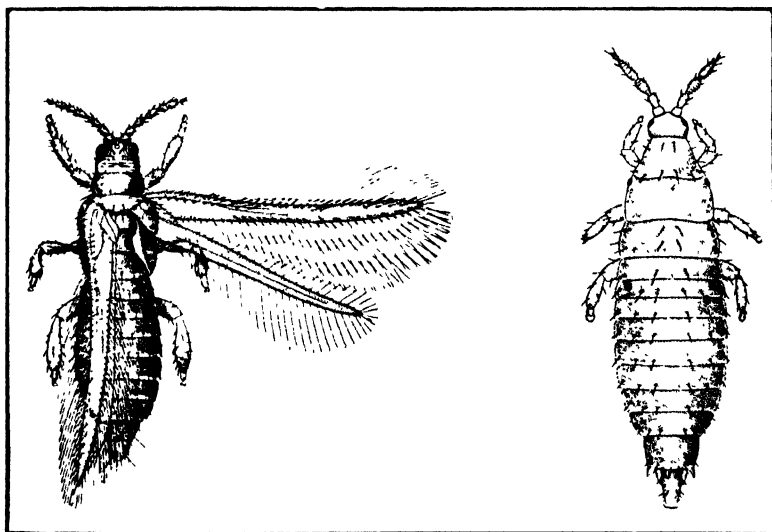


FIG. 1. PEAR THRIPS, *TAENIOTHRIPS PYRI*
Adult on left; larva on right. (After Moulton, U. S. Dept. Agriculture)

invasion of other districts in the near future.

Dr. Hewitt advocates spraying as the most effectual means of control and quotes the recommendations of Parrott, of New York State, and of the State Horticultural Commission of California. The former advises the use of nicotine preparations in conjunction with kerosene emulsion or soap, whilst the latter recommends a distillate oil emulsion in combination with nicotine.

There is some doubt in regard to the question of the original home of the thrips, as Dr. Hewitt points out.

an old and well-known European species, *Taeniothrips inconsequens* Uzel.

In order to acquire a first-hand knowledge of the destructiveness of the insect and its control under Canadian conditions, the authors were charged with the investigation of the problem. In the control phase of the work we had the assistance of Mr. E. W. White, Field Inspector of the staff of the Provincial Horticulturist, British Columbia, for whose valuable services we are greatly indebted. So far as has been possible this season,

a study has been made of the life-history and biology of the thrips in several orchards situated variously at Royal Oak, Keating and Gordon Head on the Saanich peninsula of Vancouver Island. At all three centres extensive experiments have been carried on with a view to finding a reliable method of control and the most suitable time to prosecute the spraying campaign. It is our purpose in this article to furnish a report of the progress that has been made and to indicate what steps are

LIFE-HISTORY

This year's records show that the adults first began to appear on the trees in the last days of March. Towards the end of May their numbers subsided, a few remaining over until the middle of June. The period of maximum infestation depends on the rapidity with which their emergence from the soil proceeds. For about three months previous to assuming their aerial activity, they have been leading an inactive exist-



FIG. 2. TWIG OF DUCHESS ANGOULÊME PEAR ON LEFT, THE BUDS OF WHICH HAVE BEEN KILLED BY THRIPS, COMPARED TO THAT OF RIVERS PRINCESS WHERE THE BUDS HAVE NOT BEEN ORIGINALLY ATTACKED AND HAVE SET THEIR BLOSSOM
(Original)

necessary to effect a satisfactory check to the injurious activities of the thrips. We would point out that many questions involved in the investigation must be supplemented before hypothetical statements can be replaced by material facts. Yet, we have no doubt that it is timely to impart to the growers some of the conclusions to which our researches have so far led us.

ence in their subterranean cells. As soon as conditions are favourable they burrow to the surface and reach the trees.

From April 18th to May 10th, the adults were busily engaged laying their eggs. By means of the sharply pointed, down-curving, saw-toothed composite ovipositor, which is attached near the end of the body, the insect pierces the stems of the blossoms and leaves of pears, apples, cherries and plums. The egg is then

deposited in the wound thus made, and in time a small brown scar indicates where the damage has been committed. Prunes and cherries seem to be selected for egg-laying preferably to apples and pears. On fifty blossom stems of Italian prunes, 361 egg-scars were counted. On a similar number of Olivet cherries there were only 85, but fifty leaf-stems of the latter variety revealed 184. Undoubtedly, much of the premature falling of fruit must be attributed to the weakening of the petiolar tissue by these minute egg-scars.

Before finally changing to the winged, adult stage, the larvæ transform to the resting condition known as the pupa, during which the animal is incapable of committing injury. This stage persists for only a short period, perhaps about two months.

INJURY TO TREES

The principal damage to deciduous fruit trees is effected on the buds by the feeding activities of the adults. In the spring the blighted buds of pears are the first to arrest attention. Working their way in between the



FIG. 3. APPLES OF THE RED CHEEK PIPPIN VARIETY IN FULL BLOSSOM
Sprayed with Miscible Oil No. 2 and Black Leaf 40. The thrips was practically controlled, and these trees subsequently bore a heavy yield of fruit. (Original)

The small, active, white larvæ were first observed on May 1st. After feeding on the blossoms, young fruit and leaves for three weeks, they fall to the ground which they enter by any convenient cracks or crevices. They may penetrate as deeply as 15-16 inches. Very few remain in the surface mulch in cultivated orchards, so that ploughing and cultivating with a view to their destruction would seem to be of comparatively small importance as remedial measures.

opening scales, the adults scrape and rasp the tender parts within by means of their sharp, needle-like mouth parts. As a consequence the buds begin to "bleed," exuding sugary sap which crystallises by evaporation on the exterior of the bud, imparting to it a glistening appearance. Where a number of individuals are working on the same bud, it fails to swell and assumes a shrivelled, scorched appearance, characteristic of intense infestation. The buds are

then peculiarly liable to attack by blue moulds which cause them to turn a bluish-black colour. When this happens, they are beyond all hope of recovery. The damage throughout a pear orchard is not always by any means uniform, and, as yet, no satisfactory explanation of this phenomenon can be offered. Some varieties also seem to be more susceptible to attack than others, especially early ones. On this account, Louise Bonne, Flemish Beauty and Rivers Princess, all late in their development, do not appear to suffer to the same extent as the earlier Rose and Bartlett.

Observations show that apples can ward off the effects of the adults' attack better than pears, and although a favourite feeding-place of the larvæ is the honey glands of apple blossoms the damage they commit here is not very extensive. The King variety was most heavily infested this season, but, notwithstanding, there is a heavy set of fruit showing little injury.

One of the most unsatisfactory aspects of the thrips attack in the Saanich peninsula is the repeated failure of the prune crop. The buds are very soon destroyed once the pest effects an entrance, and the damage done to Italian prunes and different varieties of plums is probably far heavier proportionally than that done to pears. Even if the fruit does set its market price is often very greatly depreciated in value by the injury, mainly caused by the larvæ, known as "scabbing." There can be no greater incentive to the adoption of rational methods of control than the story of prune destruction in the Saanich peninsula.

Cherries may suffer badly, but efficient spraying will control the insects working in the bud clusters which lend themselves peculiarly to the penetration of the liquid. In one instance where there was a good setting of fruit, the effects of the spraying operations were negated by two sharp attacks of frost on May 11th and 12th. The larvæ of the thrips demonstrated their ability to supplement the adult damage by perforating the leaves of the cherry to such an extent that one might imagine a similar condition arising from the repeated delivery of small shot amongst the foliage.

CONTROL

An extensive campaign of spraying was undertaken this spring at



FIG. 4. TWIG OF OLIVET CHERRY

The blackened mass at the base of the blossom cluster represents the dead blossom cluster killed by the thrips the previous year. (Original)

Gordon Head, Keating and Royal Oak, all in the Saanich peninsula of Vancouver Island. For general spraying the formula of the mixture was as follows:—

Whale Oil soap	5 lb.
Black Leaf 40..	$\frac{1}{4}$ pint.
(Nicotine Sulphate).	
Water	100 gals.

The results in the main were quite satisfactory, and, where the mixture was properly applied, it more than fulfilled expectations. In all, three applications were made on apples and pears: 1, just as the buds were bursting; 2, when the blossoms were showing pink; 3, when the blossoms were shed. For the second and third applications, lead arsenate at the rate of 4 lb. per 100 gals. was added to the mixture to combat leaf-eating caterpillars. In the case of prunes, plums and cherries only two applications were made, one before blossoming and one after. It has been rather difficult to ascertain whether the latter course was wisely adopted. At Royal Oak, at least, an important factor in the shape of two sharp attacks of frost, seemed to interfere with a proper interpretation of the results.

At each of the three centres experimental plots were reserved in certain orchards to test the insecticidal value of Miscible Oil No. 2 prepared by the Balfour, Guthrie Co., of San Francisco, Cal. It is said to have done admirable work as a component of spraying mixtures in the thrips-infested orchards of California. As a result of our experiments, however, we do not yet feel in a position to recommend its general adoption in British Columbia orchards, for great care must be exercised in its use.

The formula of the mixture containing oil is:—

Miscible Oil No. 2.....	5 gals.
Black Leaf 40, (Nicotine sulphate),	1 pt.
Water.....	200 gals.

The chief objections to its use are two. The first is that at the above strength a decided browning of the foliage ensues, popularly known as "burning". At lesser strengths of 3 and 2 gals., there were still marked traces of its deleterious effects. We must hasten to add, however, that the injured leaves seemed to recover after a time. The second objection that is raised is that the oil persists on the branches and trunk of the tree in such a manner as to negative the full benefits of the autumn application of Bordeaux mixture for combating apple and pear scab. In other words, the Bordeaux mixture will not mix with the oil, which forms a kind of waterproof coating on the bark. So far, we are not in a position to give a first-hand opinion on this fact, but we should judge it to be ostensibly correct. All we would say is that the oil has apparently greater powers of penetration than the soap, in virtue of its superior wetting capacity. Therefore it probably does better work than the soap in the first spraying by reaching the thrips feeding well inside the opening buds. The soap, however, cannot be gainsaid in the capacity of an adherent for the Black Leaf 40, which it brings into close contact with the thrips. Once the soap-nicotine sulphate film forms about the insect it doesn't survive many minutes.

The value of spraying may be judged from the percentage larval mortality following an application of the whale-oil soap mixture at Keating:

The number of thrips larvæ on the trees before and after spraying and percentage larval mortality May 17-27.

Variety.	Av. no of larvæ per 100 calyces before spraying.	Av. no of larvæ per 100 calyces before spraying.	Percentage larval mortality due to spraying.
Baldwin	240	80	66 7
Bell de Boskoop	254	81	68.9
Canada Reinette	222	42	82 0
Delicious	80	4	95 0
Gravenstein	156	70	55.1
Grimes Golden	328	64	80 5
Gano	64	4	93 8
Jonathan	148	56	75 7
King	443	135	69.5
Ribston Pippin	136	32	76 5
Red Astrachan	280	44	84 3
Stark 1	304	73	76 0
Average			77 0

In spraying against adults the results were equally as favourable as against the larvæ, but an opportunity will be given at some later date to give account of this phase of the work.

DISTRIBUTION IN BRITISH COLUMBIA

The pear thrips has been taken throughout the district lying between Victoria and Sidney, in the Saanich peninsula. It is more or less uniformly distributed within this area with a few centres of more severe infestation. It has also been found at Duncan and there is reason to suspect it also exists at Nanaimo. Thus far no record of its

presence has been noted on the mainland of the province.

CONCLUSION

In conclusion it is well to state clearly that the emergence and life-history dates given in this paper are those occurring during the 1916 season, and that the climatic influence in the opening of the spring, governs the situation. Hence due latitude must be given and a close watch be kept for the first appearance of the adults next spring, as indeed every spring. It is only in this way that control measures can be applied intelligently and success attend the applications.

THE DESTRUCTIVE INSECT AND PEST ACT

HIS Royal Highness the Governor General in Council is pleased to order that the general regulations under the Destructive Insect and Pest Act, approved under date the 4th November, 1914, and amendments thereto, be, and the same are hereby further amended by striking out Regulation IV and substituting therefor the following:

"IV. An inspector shall have power to enter any lands, nursery, or other premises where there is reason to believe that any of the insects, pests or diseases hereinafter specified (*vide* Regulation X) are or may be present, or where there exists trees, shrubs, or other vegetation which prevents the

successful control of the said insects, pests or diseases. An inspector shall give such instructions as may be necessary for the treatment or destruction of any tree, bush, crop, or other vegetation or vegetable matter or the containers thereof, which may be found or suspected to be infected with, or constitute an obstacle to the successful control of any of the insects, pests or diseases hereinafter specified, and such instructions shall be carried out by the owner or lessee of the infected, suspected or menacing vegetation, vegetable matter or containers thereof, and such remedial treatment shall be carried out and continued until the insect, pest or disease shall be deemed by the inspector to have been exterminated or the menace removed. The inspector shall have power to carry out the required treatment or destruction if necessary."

THE DAIRY AND COLD STORAGE BRANCH

TRANSPORTATION OF DAIRY PRODUCTS

BY W. W. MOORE, CHIEF OF MARKETS DIVISION

BUTTER

THE special refrigerator car services for butter (operated by the different railroads in Eastern Canada under the supervision of this Branch) which came into operation on May 8th, were terminated on October 7th. The cars were well patronized during the season, and, notwithstanding the very hot weather experienced in July and August, the butter as a rule was delivered at Montreal, Toronto and the other centres in good condition. A large proportion of the butter carried by these cars was exported to the United Kingdom, although at times refrigerated accommodation in the ocean steamers was difficult to obtain.

A feature of the season at Montreal, especially during the latter part, was the arrival of carloads of butter for export from several states of the Union, including the far western state of Washington, and also from Western Canada.

Up to the 5th of October the total quantity of butter received at Montreal exceeded the previous year's receipts by over 81,000 packages, but at the same time the stock of butter, including creamery and dairy, in store at Montreal, was approximately 10,000 packages less than on the same date in 1915.

CHEESE

The reports of the Department's inspectors at the Montreal railway terminals indicate that the condition of the cheese boxes on arrival there this year has been much better than formerly. Better stock seems to

have been used by the box manufacturers and more care has evidently been taken in stowing the boxes in the cars and in the handling generally by the transportation companies.

Shipments to Great Britain have been unusually heavy, several record breaking cargoes having left the St. Lawrence during the summer months, one steamer sailing in July with over 73,000 boxes.

During the extremely hot weather which prevailed in July and August a considerable proportion of the cheese that was shipped to Montreal in box cars, and in refrigerator cars without ice, were delivered to the dock in a very heated state, and consequently did not go aboard the steamers in a satisfactory condition. The irregularity in the sailings of some of the ships, and the difficulty experienced at times by shippers in securing ocean space, naturally aggravated the situation, so that several cargoes of cheese were discharged at ports in Great Britain in bad shape. A number of the old ships that had good reputations as carriers of cheese, owing to the fact that they were well equipped with cooled air compartments and ventilating fans in the ordinary holds, have been removed from the St. Lawrence route since the war began, and their places taken by boats that are not so well equipped in these respects. If all the cheese had been thoroughly cooled before being loaded into these steamers, however, there is no doubt the proportion of heated cheese on arrival in Great Britain would not have been nearly so great.

THERMOGRAPHS

Thermographs were placed with perishable cargo on all steamers sailing from Montreal that were expected to return to that port, and copies of the records have been furnished to steamship agents, shippers, and others interested, on request. Owing to the conditions referred to above a number of unusually high records of temperature have been obtained.

MEATS AND EGGS

Canadian meat-packing plants have sent forward to England heavy consignments of bacon and the reports of the Department's cargo inspectors on both sides of the Atlantic indicate that in many cases the Canadian case is not strong enough to stand the rough handling that is inseparable from existing transportation conditions. There has also been this year a considerable increase in the export trade in Canadian eggs.

THE FRUIT BRANCH

THE APPLE SITUATION IN EASTERN CANADA

BY F. H. GRINDLEY, B.S.A., ASSISTANT TO THE COMMISSIONER

THE Ontario apple crop is undoubtedly the poorest in quality and the lowest in total yield that has ever been harvested in that province. A general report on all districts in Ontario would not place the quantity of No. 1 fruit at more than 20 per cent, and in many sections it would be even less than that. The continued wet weather during June and July caused a very serious development of apple scab and it was not possible for growers to get on to their land in order to make early sprayings. Consequently the disease spread rapidly, and, although growers gave very careful attention to their orchards as soon as they could, the results were by no means satisfactory. This wet period was followed by excessively dry weather, causing a heavy falling off of fruit and thereby lowering the total yield. There are some orchards in the Georgian Bay district, as well as along the north shore of Lake Ontario, and in the McIntosh country south-east of Ottawa, where apples will be clean. Such orchards are comparatively few in number, and will not affect the general situation in the province.

Owing to the fact that many

apples which would otherwise grade No. 1 have been reduced to No. 3 on account of scab, and are practically sound and serviceable, growers have asked that they be allowed to use special brands for packages containing such fruit. The use of terms, such as "Good No. 3", "Large No. 3" and "Special No. 3" has therefore been permitted by this Branch, it being clearly pointed out, however, that the fruit contained in packages so marked shall be of superior quality to the ordinary No. 3, and not inconsistent with the brand stamped upon the package. Consumers will consequently be able to secure apples suitable for home use at low prices, and the grower will at the same time receive larger returns than he would for fruit marked only No. 3. This is explained by the fact that the term No. 3 has, during recent years, been popularly supposed to designate an apple of very inferior quality.

QUEBEC

The province of Quebec, which is noted for its Fameuse and McIntosh, will produce excellent crops of these two varieties. The districts, however in which McIntosh and Fameuse apples are grown, are not

large in area and the total production is not sufficiently great to place these apples before the public at what might be considered reasonable prices. Growers are now holding their No. 1 McIntosh at between \$6 and \$7 per barrel f.o.b., and Fameuse about \$1 less per barrel.

Consumers in Ontario and Quebec may expect to pay high prices for any No. 1 fruit they purchase, but as already stated there will be a large quantity of apples, reduced to No. 3 on account of scab, which can be bought at very reasonable prices and will be quite satisfactory for ordinary household purposes.

NOVA SCOTIA

Coming now to the province of Nova Scotia we find the situation vastly different to that which exists in Ontario. The crop throughout the entire length of the Annapolis Valley is of very high quality, although not any larger in yield than in 1915. Probably 500,000 barrels of apples will be marketed from this section, and a very large percentage of these will be No. 1. The principal market for Nova Scotian apples is in the Old Country. On account of the

shortage of fruit in Ontario, large quantities will be shipped to points in the Canadian West and Eastern Canada. Nova Scotian apples are nearly all marketed co-operatively, and, consequently, the fruit shipped out under any particular grade is uniform in size and quality for that grade.

The facilities for exporting Canadian apples this year are just as unfavourable as they were in 1915. There is the same irregularity in service and difficulty in securing cargo space. It is interesting to note that the Cunard Steamship Company has decided to use Halifax as its winter port for the Bristol service. This will greatly facilitate direct apple shipments from Nova Scotia to that market and growers will do well to take advantage of this arrangement. There is a large and important apple consuming territory in and around Cardiff which has heretofore been handicapped by lack of direct steamship service. The opening up of a direct service between Halifax and Bristol will place Cardiff in a much better position than previously, when it had to depend upon Liverpool and London for Canadian apples.

THE LIVE STOCK BRANCH

CONSERVATION OF BREEDING AND FEEDING CATTLE IN THE WESTERN PROVINCES

CONTINUING the propaganda, initiated by the Live Stock Branch of the Dominion Department of Agriculture with the publication of Pamphlet No. 20, entitled "Finish the Feeders in Canada; Keep the Heifers at Home," for which Mr. John Bright, Live Stock Commissioner, and Mr. H. S. Arkell, Assistant Commissioner, are jointly responsible, and which was summarized by the authors at some length in the September number of *THE AGRICULTURAL GAZETTE* (page 791), the following bulletin, inscribed Form No. 1, giving the

regulations that have to be followed in pursuance of the "car-lot policy" adopted by the Branch, has been issued with a view to furnishing aid in the conservation of breeding and feeding cattle in the Western provinces:

Under the direction of the Minister of Agriculture the Live Stock Branch of the Department will pay the reasonable travelling expenses of a farmer, or the authorized agent of a number of farmers, from any section of Canada, desiring to purchase one or more carloads of breeding stock or of feeding and stocker cattle in any part of the country.

A systematic effort in Western Canada to conserve cattle suitable for breeding

and feeding purposes has been made by providing special facilities for parties wishing to take advantage of this assistance at any of the Western stock yards.

The expenses of farmers buying cattle under these conditions at such stock yards will be paid, in accordance with the general terms of the policy as stated above, and in addition the services of representatives of the Branch will be available in an advisory capacity if so desired. The actual purchasing must, however, be done by the buyer himself or through his authorized agent. Under no circumstances will any responsibility in this connection be assumed by any officer of this Branch.

It must be distinctly understood that no assistance under this policy can be rendered when stock is purchased for speculative purposes.

The expenses will cover railroad transportation from the home of the purchaser to the point at which it is expected that the purchase will be made, also hotel expenses and livery expenses (exclusive of automobile hire) for the time which should be sufficient to purchase the consignment.

No assistance in the payment of freight is given, nor is any responsibility assumed by the Branch in connection with the purchase price of the shipment.

The purchaser should keep vouchers for all expenditures of two dollars or over, and should include with his account all such vouchers, together with a duplicate copy of the receipted shipping bill. The account should be forwarded in duplicate on forms which will be supplied for the purpose.

The purchaser is further required when forwarding his account to include a statement regarding the purchases covered by the account on forms prepared by the Branch. These forms, together with the expense account forms referred to in the preceding paragraph, may be obtained from the representative of the Branch at the Winnipeg Stock Yards.

Parties wishing to secure breeding or feeding cattle and desiring to take advantage of this policy should make out their applications for this assistance on forms which may be obtained upon request from the manager of their local bank, who will be in a position to give further particulars of the scheme. These forms, when completed, should be forwarded to Mr. D. M. Johnston, Market Representative of the Live Stock Branch at the Union Stock Yards, St. Boniface, Manitoba.

EXPLANATIONS

Accompanying Form No. 1, as given above, is Form No. 2, furnishing under the heading "Explanatory Notes," additional information for farmers desiring to purchase cattle for breeding or feeding purposes. In these notes it is explained that the Dominion Live Stock Branch

has a staff of men at work whose duty it will be, during October and November, to encourage farmers to purchase breeding and feeding cattle to prevent their slaughter or exportation, and that Mr. D. M. Johnston, Market Representative of the Branch at the Union Stock Yards, St. Boniface, Manitoba, will be in charge of the work and will answer any inquiries. It is stated that the Bankers' Association of Western Canada, through the branch banks, will support and co-operate in the movement by financial assistance, and by supplying information. Farmers are advised to consult their local freight agents regarding reduced rates on return of car-loads of stock from the central yards.

THE FORM OF APPLICATION

Form No. 3, issued simultaneously with Forms 1 and 2, supplies as follows the Form in which application is to be made for right of participation in the car lot policy detailed in Form No. 1:

FORM No. 3.

THE DOMINION OF CANADA. DEPARTMENT OF AGRICULTURE. LIVE STOCK BRANCH.

MR. DAN. M. JOHNSON,
Markets Representative,
Live Stock Branch,
Dominion Department of Agriculture,
Union Stock Yards,
St. Boniface, Man.

..... address date

Dear Sir, —

On or about..... I
propose to purchase at the stock yards
at.....
cattle for breeding purposes.

Such cattle will be purchased not for speculative purposes, but for my personal use only, or for the personal use of parties listed below, who have authorized me to act as their agent.

Name of Purchaser	No. of Animals	Class	Sex

I hereby make application to have the policy of the Dominion Live Stock Branch designated as "Car Lot Policy" apply in connection with this purchase.

(Signed).....

THE SEED BRANCH

THE GRADING OF SEED GRAIN

THE following Order in Council governing the grading of seed grain was passed in October, 1916:

WHEREAS it is deemed desirable in the execution of the powers conferred by Section 2 of the Seed Control Act, that special grades of grain should be established exclusively for seed purposes without affecting the commercial grades fixed under the authority of the Canada Grain Act;

AND WHEREAS the primary purpose of providing a special grade of grain that may be suitable for seed is to create a substantial supply of Red Fife and Marquis Wheat, white oats and six-rowed barley that is clean, of superior quality and reasonably pure as to variety or type of grain, so that such supply of grain may conveniently be made available to farmers, seed merchants or grain dealers who sell seed at the minimum cost; the main object is the improvement of field crops;

THEREFORE the Governor General in Council, under and in virtue of the provisions of section 2 of the Seed Control Act, is pleased to order and it is hereby ordered as follows:

The nomenclature of grades of grain for seed purposes shall be as follows the same having been revised and approved by the chief Inspector of Grain and recommended for approval by the Minister of Agriculture, viz: -

No. 1 Canada Western seed oats shall be composed of No. 1 or No. 2 C. W. oats and shall contain 95 per cent of white oats, sound, clean and free from other grain; shall be free from noxious weed seeds within the meaning of the Seed Control Act, and shall weigh not less than 34 pounds to the bushel.

No. 3 Canada Western seed barley shall be composed of the six-rowed variety, sound, plump, free from other grain, of fair colour, free from noxious weed seeds within the meaning of the Seed Control Act, and shall

weigh not less than 45 pounds to the bushel.

No. 1 Manitoba Northern Seed wheat shall be composed of 85 per cent of Red Fife, or 85 per cent of Marquis wheat, sound, clean and free from other grain, and free from noxious weed seeds within the meaning of the Seed Control Act, weighing not less than 60 pounds to the bushel.

For No. 1 seed purposes Red Fife and Marquis wheat shall be kept separate.

No. 2 seed wheat shall be composed of grades No. 2 Northern, No. 3 Northern, or No. 4 slightly frosted wheat of Red Fife or Marquis variety, and when recleaned shall be practically free from other grain and noxious weed seeds, and the weight not less than 58 pounds to the bushel.

For No. 2 seed purposes Red Fife and Marquis wheat shall be kept separate.

No grain shall be accepted for seed which will require a large dockage to clean.

Seed Inspectors shall observe the foregoing regulations in the grading of grain for seed purposes; nevertheless inasmuch as the operations of seed inspectors are dependent upon and follow after the operations of grain inspectors in respect of the grain to be examined as to suitability for seed purposes, the seed inspectors will remain subject to the approval of the chief inspector of grain or his deputy in all matters of procedure and prompt attendance to duties and for efficiency and accuracy of technical work done, seed inspectors shall be responsible to the Minister of Agriculture.

Seed inspectors are hereby authorized to certify ex-elevator the grain graded for seed purposes pursuant to the foregoing regulations.

The Order in Council, dated 30th September, 1915, establishing special grades of grain for seed purposes is hereby rescinded.

PART II

Provincial Departments of Agriculture

AGRICULTURE IN CANADA

PRINCE EDWARD ISLAND

BY W. R. REEK, B.S.A., DIRECTOR OF AGRICULTURAL INSTRUCTION

PRINCE EDWARD ISLAND, the "Garden of the Gulf", though the smallest of the provinces, with an area of 1,397,991 acres, has compensation for its smallness in size in the great potentialities of its soil and climate. The soil is exceedingly fertile and responsive; the uncultivateable areas are negligible. The climate is such that seldom do we have crop failures owing to extremes over which we have no control; it is truly temperate. Small forest areas are prevalent in all parts, which supply the necessary lumber and wood; groves are numerous and scarcely can a homestead be found that does not nestle in one of these which affords protection in winter, and adds greatly to the beauty of the rural parts. Beautiful landscapes of green fields, birch and evergreen clumps and whitewashed buildings, a bracing atmosphere and an exceedingly hospitable people, cause the first impressions received by the traveller to be favourable.

A PROVINCE OF SMALL FARMS

It is a province of comparatively small farms. There are 14,369 holdings; those classified are: (1) between 100 and 200 acres, 3,227; (2) between 50 and 100 acres, 5,494; (3) between 10 and 50 acres, 3,849. There are a few larger

holdings, but as yet the general tendency is to keep between 50 and 125 acres to a farm. General agriculture is followed, with emphasis upon dairying, because the climate is ideal for the production of high class products; the pastures are generally good, owing to the rather high precipitation; the soil suitable for raising the foods essential for the dairy cow; springs are numerous, which ensures an abundant supply of fresh cool water; the factories are well established, and the labour question was never serious, until the war came. Because 90 per cent of the people are engaged in agriculture, the contingents principally came from rural districts.

THE PRINCIPAL CROPS

Hay, oats, turnips and potatoes are the principal crops, whereas wheat, barley and mangels are grown in rather small areas as yet. The Banner oat has already made a reputation for the Island; many thousands of bushels are supplied to the Eastern Provinces yearly for seed purposes. Nearly every farmer grows potatoes as a commercial commodity. The blue potatoes are the favourite, because the maritime markets, such as Sydney and Newfoundland, demand large quantities, but the white varieties are gaining and doubtless will continue

to do so as the markets become extended. The "Old Island Two-Rowed" barley is a promising variety; it accommodates the farmer by dropping its awns in the field when ripe. Clover is gradually replacing timothy.

The soil is a red, sandy loam, with occasional stretches of heavy clay or sand, rather easy to cultivate and very responsive to proper

the cost of tile made under-drainage appear an economic impossibility. The peaty areas may be of value at some future time. The blueberry barrens and cranberry fields produce heavily, and are not to be despised, because the markets in the New England States and the Eastern Provinces will consume all that can be gathered with the available labour.



A VILLAGE HOME

The white birch trees are native and greatly add to the beauty of the province. (Photo by W. S. Louson)

treatment. In many parts, which is true of all the Maritime Provinces, a slight acid state is prevalent, but is corrected by an application of mussel mud or lime. All wet soils can be easily drained; land drainage is in its infancy, but the building of a tile plant will bring about the reclamation of every unreliable or swampy area for a reasonable expenditure, because expensive outlets are unnecessary. Previously,

TOPOGRAPHY AND PRODUCTION

The contour of the land in Kings and Queens counties is gently undulating, allowing excellent drainage, but not causing any large areas of waste land, whereas in Prince county the flatter and wetter areas are prevalent and in a few districts the heavy clays are present, but generally sandy loams prevail throughout.

The production of small seeds,

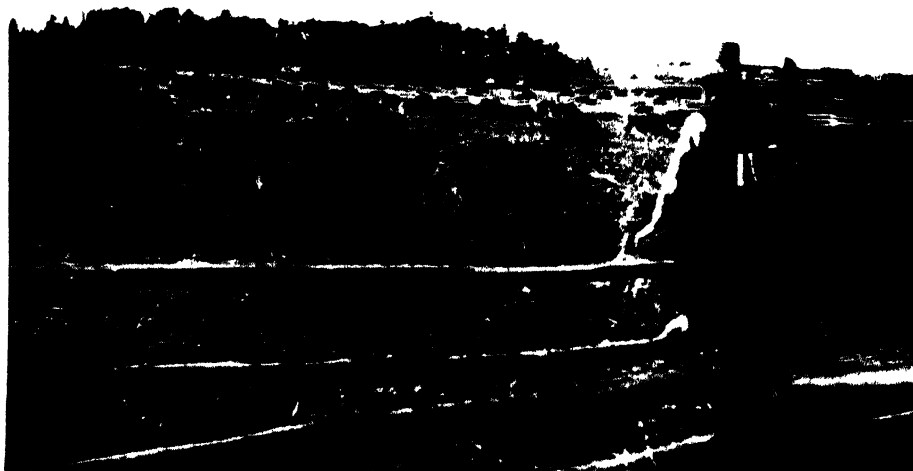
such as turnip, mangel, clover and others, is as yet practised on a small scale only, but every indication points to an excellent future—the seed is good and the season quite suitable.

Tree fruits are grown in restricted areas only. Several years past, many purchased nursery stock and the orchards were generally well cared for, but some were disappointed to find, when bearing time arrived, that often inferior varieties had been purchased. A depression in orcharding naturally resulted. However, some are producing apples of ex-

cellent quality, but the growing of apples commercially on a large scale requires careful consideration. Small fruits, such as the strawberry, raspberry, gooseberry, and currants can be produced successfully and marketed with decided advantage, because of the superior quality and rather late ripening season, which eliminates competition on the larger markets from many outside districts.

TOTAL CROP PRODUCTION

The following table will give an idea of the crop production:—



PRINCE EDWARD ISLAND SOILS PRODUCE LARGE CROPS OF BANNER OATS

(Photo by W. S. Louson)

Crop.	Aver. 1909-14.	Yield 1914	Yield 1915	Value 1915
Wheat	533,000 bus.	550,000 bus.	600,000 bus.	\$ 720,000
Oats	6,368,400 "	7,250,000 "	6,500,000 "	3,120,000
Barley	156,800 "	160,000 "	130,000 "	100,000
Peas and Beans	11,800 "	15,000 "	12,000 "	30,000
Buckwheat	88,400 "	90,000 "	80,000 "	60,000
Mixed Grains	558,400 "	600,000 "	480,000 "	275,000
Potatoes	6,000,000 "	6,000,000 "	3,750,000 "	2,125,000
Roots	4,268,800 "	4,200,000 "	4,000,000 "	700,000
Hay	260,000 tons	300,000 tons	300,000 tons	4,000,000
				\$11,130,000

Averages per acre are as follows:—

Wheat	19 bus. per acre.
Oats	38 " "
Barley	27 " "
Potatoes.	200 " "
Hay.	1½ tons per acre

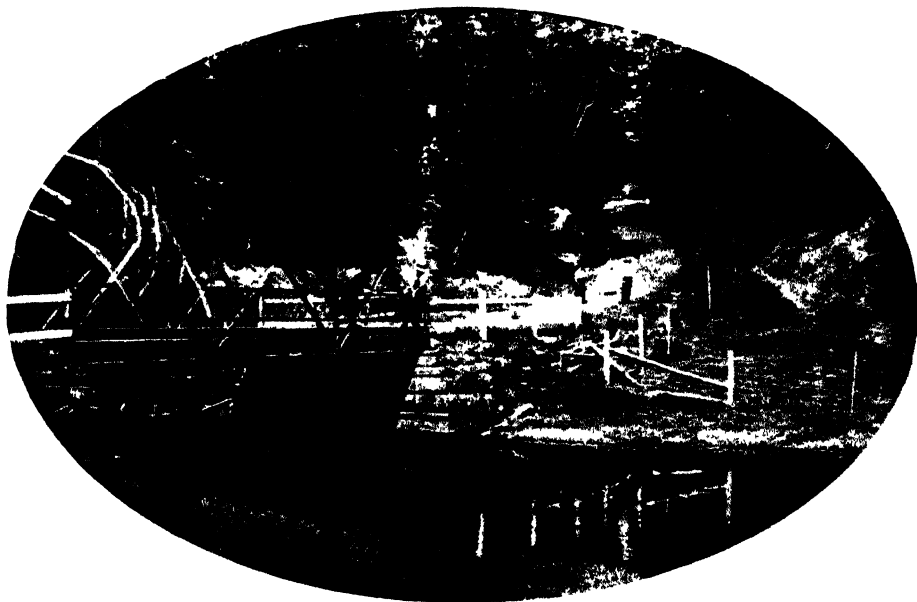
The value of dairy products for 1915 was \$478,764.53.

SEAWEED AS A FERTILIZER

Islands, and most particularly those surrounded by ice for a season, may have drawbacks, and doubtless Prince Edward Island has suffered,

manures. Probably the greatest sea manure available is the mussel mud. This is deposited in all the bays and estuaries at the river's mouths and is a product of the oysters, mussels and clams. The decaying shells give large percentages of lime and in addition there is some ammonia, potash, and vegetable matter. Twelve to fifteen tons per acre are applied.

The digging and distribution of the mud, on a large scale, has been undertaken by the provincial Government, and this is proving a great



BRIDGE AND ROAD AT BONSHAW, P.E.I.
(Photo by W. S. Louson)

but the advantages accruing very often more than counter-balance the disabilities. On every shore, whether it be an arm of the sea penetrating the land, or just the ordinary sea-shore, large deposits of seaweeds such as dulce, kelp and eel grass, are to be found and are gathered in quantities by every farmer within hauling distance. The value has not been, and probably cannot be, estimated, but the high state of fertility of those farms is unquestionable evidence of the importance of sea

boon to all the people within easy reach of the railway: it is delivered at cost.

STORY OF THE ISLAND

The Island was ceded to Great Britain by the French in 1763. The Indians called it "Abegweit"—"Cradled in the Waves." The British divided the Island into townships, or lots of about 20,000 acres, and gave them to public men upon the condition that they undertook to place a number of settlers upon the

land. The early settlers were English, Scotch, Irish and French. Practically no immigration has taken place of late and probably in no other district in America was a superior class of people to be found. All were of good ancestry and were worthy descendants. The lure of the New England States and of the West depleted the population very much and many of the ablest migrated and many prospered in their new homes. Probably no other settlement of people has wielded a greater influence in the development of America.

In 1875 the Government bought

should cease, and Prince Edward Island become in reality a part of the Dominion.

Governor Ready in 1827 was responsible for the introduction of agricultural organization, but agricultural societies were formed in 1855 and the former ceased to exist. A stock farm was established in 1866 and large numbers of superior stock were distributed throughout the Island. To-day that large, roomy, Shorthorn cow of excellent quality can be found which traces back to the early stock farm. Several subsequent changes were made and finally



A PASTURE SCENE IN PRINCE EDWARD ISLAND

(Photo by W. S. Louson)

out the landlords and the tenants became the owners of the land. Absentee landlordism had not been conducive to progress.

PROGRESS OF AGRICULTURE

Agricultural development was greatly retarded, because of poor communication with the mainland, which doubtless accounted for the loss of so many settlers. However, the present arrangements are much better than those of a few years ago, and when the car ferry commences operations the transportation difficulties

the farm was handed over to Falconwood asylum. Dairying received its great impetus from Dr. James W. Robertson in 1891, when co-operative factories were established, forty of which are still in operation. During the last few months great improvements in plants and output have taken place.

A regular Department of Agriculture was organized in 1901. Farmers' institutes were organized as in other provinces. Owing to lack of funds the major portion of the work was carried on by the Secretary for Agriculture.

THE AGRICULTURAL INSTRUCTION ACT made possible a much more vigorous campaign and new activities were undertaken.

Women's institutes were organized and the people very eagerly engaged in the new work, with the result that 35 active institutes were formed. Red Cross and similar work has been carried on since the outbreak of the war. Short courses are attended by women from the country and accommodation for the numbers applying is the greatest problem.

AGRICULTURAL EDUCATION

The teaching of elementary agriculture and nature study in the public schools has received considerable attention, and, to properly train the prospective teachers, a department has been fitted up in the Prince of Wales College, and a teacher with a normal training and an agricultural education is regularly employed.

All branches of agricultural work are now being undertaken, as in other provinces, though on a smaller scale. Particular effort is being made to assist those people who own the low, wet land in order that underdrains may be installed and open ditches built.

MIXED FARMING ENCOURAGED

The Island will continue to be a mixed farming district, with dairying

the most prominent branch and sheep raising following closely. The production of pork is now on the upgrade but must continue as an adjunct to the dairy industry. Few realize the immense value of the poultry products, and, with a province of small farms, the possibilities are almost beyond comprehension. More particularly is this so because in no other branch of agriculture is so much intelligent effort being applied. Climate, soil, markets, and an inclination on the part of the people, ensure the future of the small fruit industry.

OPTIMISM EXEMPLIFIED

The improved transportation facilities have engendered optimism and a greater faith in the possibilities is becoming crystallized into definite activities, not in agriculture only but in the development of other natural resources which have lain dormant for generations. Probably, never before, was the future so promising. The necessary essentials, which must enter into the upbuilding of prosperous communities, are all in evidence, and all forces are silently, but, nevertheless, surely, working together. The ultimate outcome cannot be other-wise than that Prince Edward Island will be more widely advertised and conceded to be the "Garden of the Gulf."

The farmer of to-day is a business man. His success or failure depends upon his ability to apply good business methods in the operation of his farm. The so-called "independent" farmer belongs to a past generation. The farmer of to-day cannot run his business in his own way however much he might wish to do so. As a manufacturer, he is brought into competition with the farmers not only of his own neighbourhood and province, but with the farmers of the United States, of the Argentine Republic, of Russia, and of every other part of the world. An improvement in the methods of wheat-growing in Russia may revolutionize the system of farming in Manitoba. The farmer of to-day produces for world markets where he cannot control the selling prices of his products. These are fixed by competition from all countries. His only means of increasing the returns for his labour is by controlling his production costs.—*The late Professor George G. While in "Farm Cost Accounting."*

CHEESE FACTORY AND CREAMERY INSTRUCTION AND INSPECTION

In the series of articles published herewith, there has been brought together the policies and methods of the different provinces with regard to cheese factory and creamery inspection and instruction, keeping in view the following general outline: (1) The organization for the work, (2) the number of instructors and inspectors, (3) the amount of territory and number of factories covered by each inspector, (4) the method of inspection and instruction, (5) the qualifications of instructors, (6) the frequency and duration of visits, and (7) the frequency and character of reports.

PRINCE EDWARD ISLAND

BY W. R. REEK, B.S.A., DIRECTOR OF AGRICULTURAL INSTRUCTION

IN 1898 the first Dairy Act was passed and was in force until April, 1916; doubtless, it was an excellent Act when passed, but obsolete for 1915. By it a Dairymen's Association was formed and all work pertaining to dairying was supervised by it. An inspector was appointed, and was paid jointly by the Dominion and Provincial Governments and by assessments on the factories. The result was that the quality gradually grew poorer until some of the buyers preferred not to handle our output. The remedy was to be found in strong legislation and active aggressive organization which would support an educational campaign. Last winter as a result of the dairy conference, amendments were passed to the old Dairy Act, but it still requires considerable attention before it will be equal to the situation. By it the inspector became a provincial official, paid out of the funds of THE AGRICULTURAL INSTRUCTION ACT. He is given power to condemn dirty or old rusty cans; to refuse milk or cream at a factory; to inspect the premises of the producer, and to generally supervise the making of butter and cheese and the activities relative to the production of a good article.

The work is supervised by the Provincial Department of Agri-

culture, acting jointly with the Dominion Department of Agriculture, the latter undertaking all cow-testing work and spending a great deal of time in studying the market requirements and devising methods whereby the Island output may be better suited for the consumer, thus demanding higher prices and facilitating sales. In addition, co-operation with the buyers is attempted in order to emphasize quality; so far some progress has been made. Several factories this year are being paid according to the quality produced, and if it were possible to arrange that all factories would sell on the same basis much faster progress could be made. Cream grading has been adopted in four factories and invariably the result has been more than satisfactory—the quality of the butter immediately improved. It will only be a short time before all butter factories will be following the grading system. Centralization of creameries is being urged because of the quality produced and the feasibility under such a system of purchasing the more expensive and necessary equipment. Small factories are difficult to handle because the output is so small that the salary paid is not sufficient to engage a good man and an incompetent one is secured, which makes

inspection difficult and invariably, though not necessarily, a low grade product is the result. A few of the smaller ones are likely to be merged with a larger one. Special arrangements for shipping cream have been made.

An exhibit of cheese and butter is held annually at the Charlottetown exhibition in order to give the people an idea of the quality that is produced. Two cheese are taken from the output of every factory

ability of cans, supplies on hand, and quite often makes cheese or butter. If dirty milk is being regularly delivered at the factories he often visits the patrons, giving instructions as to methods of cleaning up the premises, and for the general care of milk or cream. If unusual difficulties are encountered sufficient time is spent at a factory to overcome them, but as a rule only one day is given to each visit. Visits are made as often as possible every season,

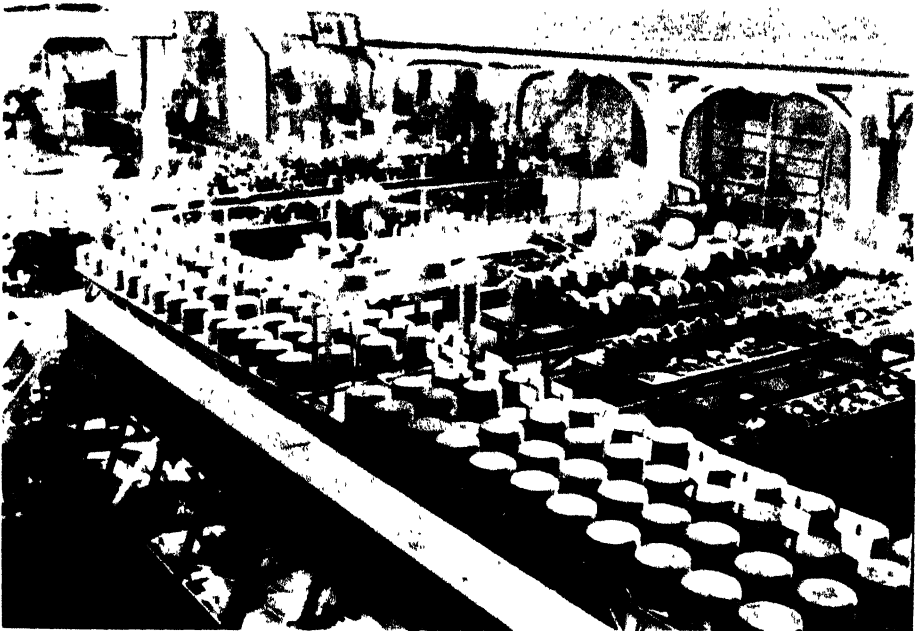


EXHIBIT OF BUTTER AND CHEESE AT THE CHARLOTTETOWN EXHIBITION

monthly by an independent party, and are placed in cold storage until exhibition time; this encourages the production of an average quality.

There is only one regularly appointed inspector, although some assistance in two creamery districts has been given. There are forty factories to be regularly inspected.

The inspector spends a full day at a factory looking over equipment, location, water supply, disposal of sewerage, washing of cans, suit-

amounting to four and five in some cases. Reports, covering every detail of manufacture, buildings, equipment, appearances, condition of milk, condition of stock on hand, and recommendations are made out every visit, and a copy left with the maker, one sent to the secretary of the company, and a third forwarded to the Director of Agricultural Instruction. Daily time reports are also made out.

Previous to the opening of the

factories this year the inspector made a special visit to many in order to give advice regarding necessary repairs. As a result many have put in new tanks, new fittings of various kinds, ordered a supply of cans, cleaned up the premises, white-washed and painted; some have installed cement floors and placed cement foundations under the buildings. Probably not for many years has there been such a general clean-up, and up to date the quality has more than warranted every expenditure made.

The instructor was manager of a factory upon the Island, and previously in Ontario, and has also taken winter courses at the Kingston Dairy School.

Probably one of the greatest needs is some method whereby the makers can be brought together and given a course in butter and cheese making. Many of them never had any instruction beyond that given by the inspector, and too often the result has been lack of uniformity in the

product owing partially to the fact that the makers have never been properly instructed in the care and handling of milk and cream, and they have been accepting much that should be refused. A dairy school where every maker could attend, and where experts could supervise the practical work, is much needed; arrangements are now pending whereby such an opportunity will be open during the coming winter.

However, unless the dealers will co-operate and make a distinction in the price paid according to quality, the efforts put forth by the Department will have little or no effect in some districts, except as conditions are covered by legislation. A flat price for cheese or butter of all qualities is not fair to the producer nor to the consumer, and such a method of purchasing is opposed to all educational work as having for its aim the improvement of quality and the growth of the industry.

NOVA SCOTIA

BY W. A. MACKAY, DAIRY SUPERINTENDENT

CHEESE factory and creamery inspection in Nova Scotia is carried out under the Dairymen's Act, passed 14th of May, 1914, and amended in 1916, which provides that all cheese factories and creameries must be registered in the office of the Superintendent of Dairying, and provides regulations for the operation and sanitation of the business.

For a number of years previous to 1916, the staff consisted of the Dairy Superintendent and one assistant. The latter has now enlisted for military service, and this year the work is being carried on largely by the Dairy Superintendent alone.

There are at present in operation twenty-one creameries and four

cheese factories, all of which are inspected at least twice during the summer months and oftener if found necessary. Visits are made unannounced, and an effort is made to be present at churning time. An acidimeter, standard acid, moisture test and report forms are carried.

The day's work is followed through as closely as possible and as the work proceeds suggestions are given as thought necessary. Inspection is made of plant and all reported on report forms with such recommendations as considered wise. A copy of the report is left at the office and, if necessary, one given to the secretary or proprietor. An effort is made to spend from one-half to one day on each visit and a report is left after each regular visit, but calls are

made at every opportunity. On these occasions, unless there is some change urgently required, no written report is left.

The reports deal with the condition of the whole plant and machinery, the quality of finished goods on hand and of goods in the process of manufacture.

It is earnestly sought to secure first the co-operation of the cheese

about the desired results. No effort is made to bring about any radical changes at once, but to gradually lead up to more advanced methods.

Cream grading has been advocated in the creameries for two years, and this year about 60 per cent of the cream is being graded.

The importance of churning records and the regular use of the acidimeter and moisture test on every

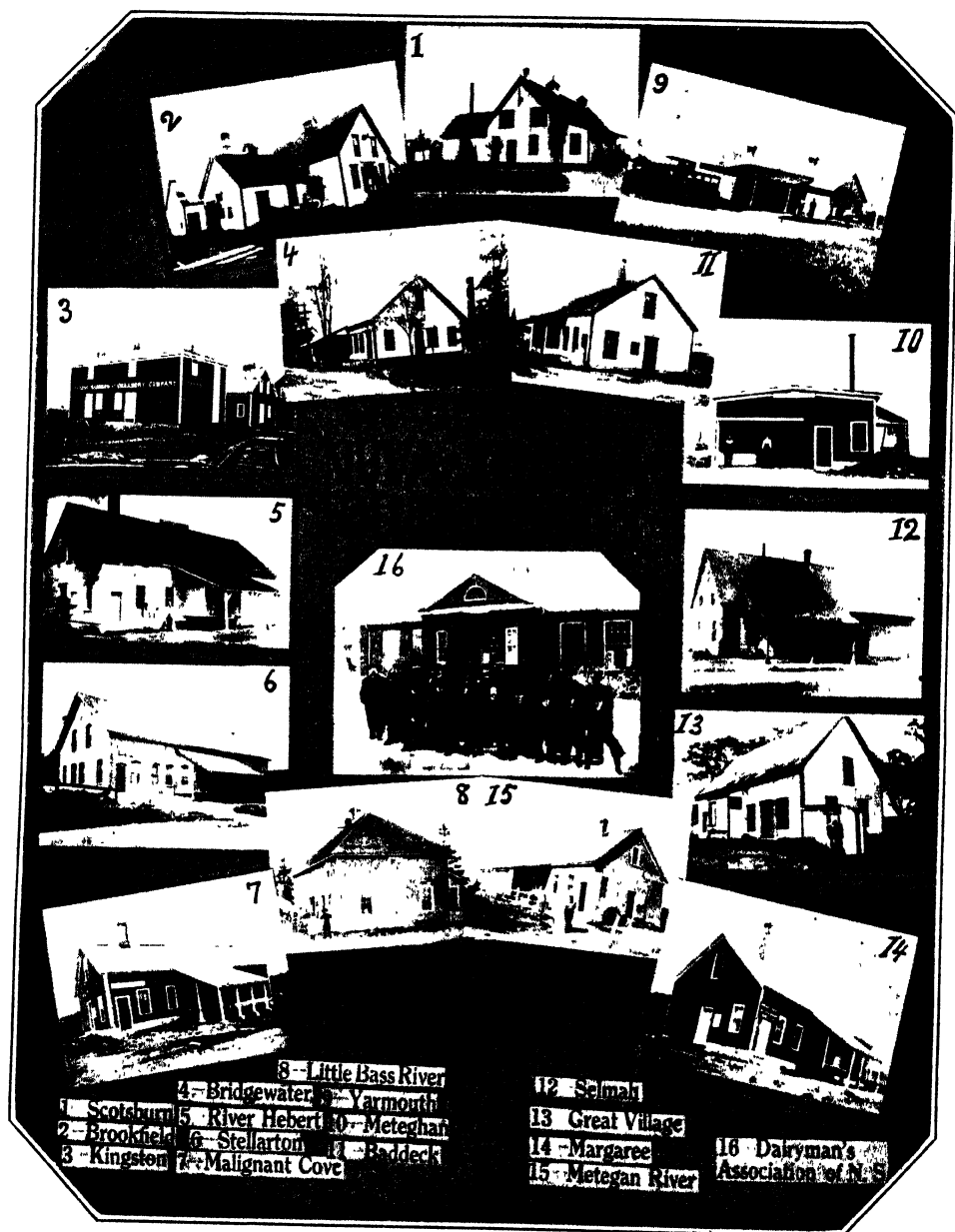


A TYPICAL NOVA SCOTIA CREAMERY AT BRIDGEWATER, N.S.

or butter maker and the Board of Directors or the proprietor to a united effort to realize the importance of getting the finest quality of goods on the market. The efforts of the officials of the Department of Agriculture are in this behalf, and, a united effort is the only thing which will bring

churning are being discussed this year with the ultimate aim of having this done regularly in all of the creameries. Special churning record books are being supplied from the Department at about cost.

The following are the report forms used in the inspection of cheese factories and creameries:



THE CREAMERY INDUSTRY IN NOVA SCOTIA

NOVA SCOTIA DEPARTMENT OF AGRICULTURE.

REPORT OF DAIRY INSTRUCTOR AND SANITARY INSPECTOR

M. CUMMING, Sec'y for Agriculture, Truro, N.S.

W. A. MACKAY, Dairy Supt., Truro.

CHEESE FACTORIES

Name of Factory.	.....	Station, County of	.....
..... miles from	.....	
President	.....	P. C.	.....
Proprietor	.....	P. O.	.....
Manager	.....	P. O.	.....
Maker	.....	P. O.	.....
Secretary	.....	P. O.	.....
Salesman	.....	P. O.	.....
No. of Patrons	{	No. of Patrons visited	{
No. of Cheese made to-day	.....	No. made same date last year	.....
Condition of Milk.	{	Acidity	.....
		Sediment	.....
Condition of Culture	.....	Milk received to-day, lb.	.....
Curd tests made	good tainted	Fat in milk	.....
Condition of Cans.	.....	% Loss in Whey	.....
		% Fat	.....
Quality of Cheese	{	Flavour	.....
		Closeness	.....
		Colour	.....
		Texture	.....
		Finish	.....
Condition of Curd	.....	
Condition of Milk	.....	
Stage of Manufacture at time of visit	.....	
Age of Cheese on hand	.....	No	.....
General appearance and site	.....	Weather conditions	.....
		
Make Room	{	Kind and Condition of Floors	.....
		Condition of Vats, Presses and General Utensils	.....
Curing Room	{	Condition	.....
		How Constructed	.....
		Ordinary or Cool-curing	.....
Water Supply	{	Source of Supply	.....
		Location	.....
		Condition of Water	.....
Sewage	{	Manner of Disposal	.....
		Kind and Condition of Drains	.....
		
Whey Tanks	{	Location	.....
		Of what constructed	.....
		Cleanliness	.....
		Is Whey properly pasteurized?	.....
		% Acidity of Whey in Tank	.....
		% Fat in Whey in Tank	.....
Appearance of Maker and Assistants	{		
Remarks	.....	
Recommendations:	.....	
		
		
The above recommendations should be carried out not later than	.....	
Copy of report given to	.....	
Date	.....	

Instructor.

REPORT OF DAIRY INSTRUCTOR AND SANITARY INSPECTOR.

M. CUMMING, Sec'y for Agriculture, Truro, N.S.

W. A. MacKay, Dairy Supt. Truro

CREAMERIES

Name of Creamery Station..

County of miles from

Proprietor P. O.

Manager

Butter-maker P. O.

Secretary P. O.

Salesman P. O.

No. of Patrons. Pounds of Cream to-day Pounds of Cream per week

Pounds of butter made to-day Pounds of butter made per week

Per cent of fat in Cream. Style of package

Are scales or pipette used

Method of Col- { Tanks, large cans, individual cans

lecting { Their condition

Condition of composite samples

Methods of Sampling Cream

Condition of Cream { Temperate Acidity

Received { Flavour and condition

Acidity of Cream when churned % Temperature of Cream at churning

Is Cream Pasteurized Pasteurizing temperature

Temperature of wash-water Is Culture used What kind

Percentage of over-run Is a Colour used What kind

REMARKS ON CHURNING.

No. of tests made for moisture Percentage of moisture

Quality of Butter { Flavour

Grain

Colour

Finish

Moisture

General appearance and site

Are the surroundings neat and clean

Manner of disposal of Sewage

Water supply

Condition of Churn, Cream Vats and General Utensils

Kind and condition of Floor

Is the Creamery clean inside

Is the Buttermilk Tank clean Where located

Temperature of Refrigerator degrees.. . . . Is Refrigerator dry

Is it kept tidy Any mould.

Condition of Boiler and Engine

Appearance of Maker and Assistants

Is anything necessary in equipment to make Finest Butter

REMARKS AND RECOMMENDATIONS.

The above recommendations should be carried out not later than

No. of { No. having good Cream No. using Separator

Patrons { No. having fair Cream No. using deep setting

Visited { No. having poor Cream No. using pans, etc.

Copy of report given by

Date of visit

Instructor

NEW BRUNSWICK

BY C. W. McDougall, DAIRY SUPERINTENDENT

IN New Brunswick the cheese factory and creamery instruction and inspection work is conducted as a branch of the Live Stock and Dairy Division of the Department of Agriculture, with headquarters at the city of Fredericton. The chief officers are known as dairy superintendents, of whom there are two; these, with one permanent and one temporary assistant comprise the dairy staff.

There are twenty-one creameries in operation and these are allotted about equally between the instructors. An effort is made to conduct the work so that the instructors will be where they are most needed. To a certain extent this makes the territory interchangeable.

Visits are made during the actual operation of the cheese factories and creameries. Inspection is made of buildings, environment, and their



ST. HILDARE CREAMERY, MADAWASKA COUNTY, N.B.

This creamery is at present being operated by the Federal Dairy Division as a demonstration creamery

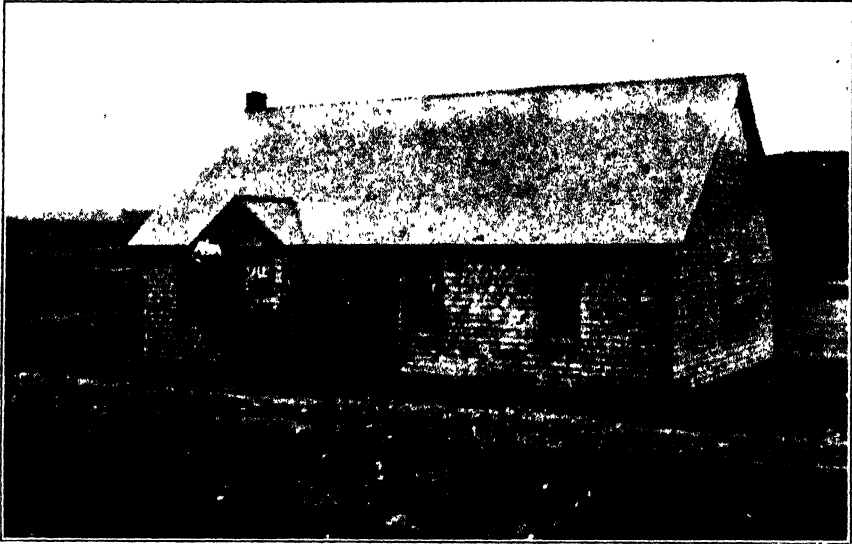
On account of the uneven distribution of the cheese factories and creameries throughout the province one officer has fewer factories and much more territory to cover than the others. To illustrate: in the province there are fifteen counties and fifteen of the twenty-six cheese factories in operation are located in one county. One dairy superintendent does all the work in the French districts, these being in the northern and eastern parts of the province.

condition; of equipment, its arrangement and condition; of quality of milk and cream supplied, of method and skill in manufacture, and of quality of finished product. A review of the full inspection suggests what is best to do under the circumstances. The aim is by skill to make the best of existing conditions and by improvement in buildings, equipment, method of manufacture, and in quality of milk and cream to make better cheese and

butter. Some of the factories are small, indifferently equipped, and operated by makers of limited experience. Obviously, to these factories more frequent visits and more practical help is needed. At these

season are being made to secure consolidation of cheese manufacture in certain districts, and to secure a more general adoption of payment according to quality.

Weekly report forms are used.



A SMALL CHEESE FACTORY OPERATED IN ONE OF THE MORE ISOLATED FARMING DISTRICTS OF NEW BRUNSWICK

factories, also, is the demand most urgent for the official testing of milk and cream.

It is the duty of the dairy superintendents to attend annual and special meetings of cheese factory and creamery patrons. Efforts this

These provide for reports on factories in detail, and also for report on allied conditions, such as condition of pasture and crops, so that the whole report may form the basis of an intelligent dairy survey.

QUEBEC

BY ELIE BOURBEAU, INSPECTOR GENERAL OF CHEESE FACTORIES

FOR the purpose of greater efficiency in teaching the best methods for the production of milk, the making of dairy products and, generally speaking, in order to hasten the progress of dairying, the province has been divided into fifty regional districts by the Quebec Dairymen's Asso-

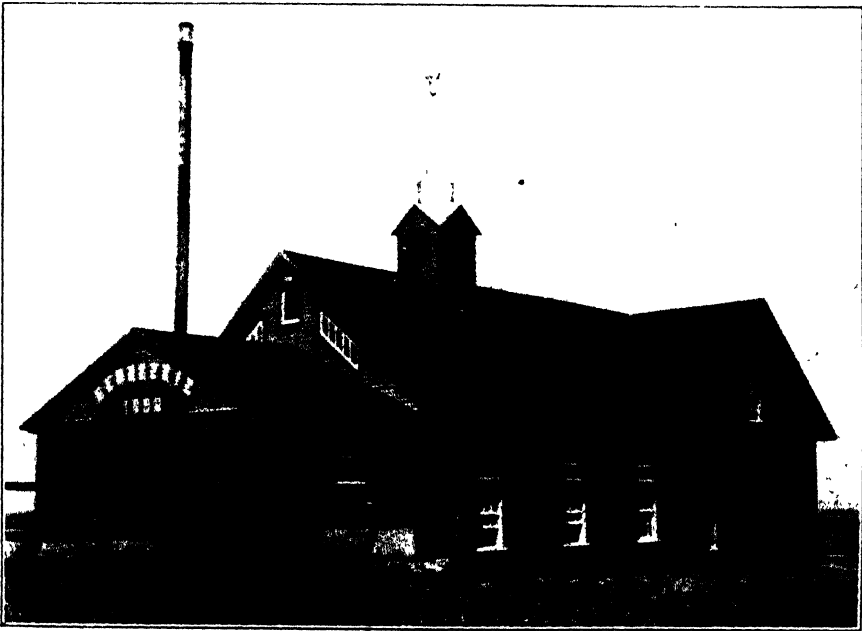
ciation, taking into account the distances to be covered and the number of factories to be visited. The average number of butter and cheese factories in each division is forty-two or forty-three.

The factories inspection service includes two general inspectors and five assistant general inspectors. The

province has been divided into five districts, each of which is under the supervision of an assistant general inspector; the districts are in turn divided into divisions, making a total of fifty, each of which is under the supervision of the local inspector.

Division inspectors make a weekly report to the Department of Agriculture, showing the work accomplished during the week, and district inspectors make a monthly report, showing the conditions of the factories

gathered cream kept with preservatives or showing more than .50 per cent of acidity, or buttermilk showing more than .60 per cent of acidity; factories not observing the regulations of the general inspector; makers, with or without diplomas, testing milk or cream without having a certificate of testing expert; methods of handling cream; number of deliveries per week; bad drainage; care of factories inside and outside; yield of butter per pound of fat;



CREAMERY AT STE. AGATHE, COUNTY LOTBINIERE

and of the milk and cream received. This report is a compilation of the weekly reports handed in by local inspectors on their respective districts.

These reports contain the following information for the general inspectors: factories receiving milk having more than 22 per cent of acidity; factories having cream separated at the factory showing more than .45 per cent of acidity at churning for buttermilk exceeding .55 per cent of acidity; factories having

factories where the curd remains more than two hours and a half in the whey, factories not pasteurizing whey, receiving milk after 8 a.m., shipping green cheese or putting the by-products in wooden vats.

The local inspector visits the factories and may remain a short while, or spend several days, if necessary. Each week, he sends in two reports: one to the Department of Agriculture and one to the assistant general inspector for the district.

In addition to these reports, the local inspector hands in, at the beginning of the season, a special report showing the designation and the number of the factories and one at the end of the season on the condition of each factory in his division.

By these various reports the Department and the general inspector are kept well informed on the work of each inspector and on the general trend of things.

have given proof of their ability in the administration of factories, and that they have the necessary qualifications so that their teachings and advice may be accepted.

The duties of inspectors are to supervise the production and the delivery of milk, the making of butter and cheese, the preparation and use of ferments for the making of either of these products, the pasteurization of milk, cream, and by-pro-



FIG. 1. A CHEESE FACTORY CONDEMNED BY THE QUEBEC DEPARTMENT OF AGRICULTURE

QUALIFICATIONS AND DUTIES OF INSPECTORS

Inspectors, including general inspectors and their assistants, must be qualified butter and cheese makers, holding diplomas, able to make tests of milk and cream to the satisfaction of the Board of Examiners of the Dairymen's Association. It is also required that these inspectors should

ducts. Each year or so, they spend a few days at the St-Hyacinthe Dairy School to keep in touch with modern methods of dairying.

They are also health officers under the law and must know general and special regulations on dairying. It is also required that they supervise book-keeping in order to prevent dishonest competition between factories and insure a fair re-partition

of the proceeds.

The Board of Examiners has been established for several years by the Dairymen's Association. In addition to the authority which it exercises as regards inspectors, it also grants certificates of competence for testing milk and cream, and certificates of qualification as cheese and butter-makers, after receiving a satisfactory report from the general inspector on the conditions of the factory and the quality of the products. These certificates, licences

by the Association and approved or modified by the Lieutenant-Governor in Council.

Since 1912, a number of small factories have stopped working, and several other factories, not having sufficient equipment, or being in a poor sanitary condition, have been condemned. When a factory is ordered closed by the Department of Agriculture, it remains closed so long as it has not been properly equipped and so long as it is not improved or rebuilt according to the



FIG. 2. A NEW CHEESE FACTORY BEING BUILT IN CONFORMITY TO THE PLANS OF THE QUEBEC DEPARTMENT OF AGRICULTURE

or diplomas, may, at any time, be cancelled by the Board of Directors, after notification given by registered letter to the interested parties on request made to this effect by one of the general inspectors or assistant general inspectors. The working of this office, the method of examination, the issuing of certificates, licences or diplomas, are governed by regulations adopted to this effect

plans of the Department.

Figure No. 1 shows one of these factories which has been closed, and Figure No. 2 shows a new factory, in course of erection, which will conform in all respects to the plans of the Department of Agriculture, viz., cement floors and platform, good system of drainage, good ventilation and good curing room.

ONTARIO

BY G. A. PUTNAM, B.S.A., DIRECTOR OF DAIRY INSTRUCTION

WHILE the complete system of dairy instruction in the cheese factories and creameries of the province as we find it to-day is a matter of comparatively recent development we find that the Dairymen's Association of Western Ontario as far back as 1879 employed specialists from New York state to go from factory to factory throughout Western Ontario with a view to introducing methods of manufacture with the object of improving the quality and establishing a uniformity in the

one for Eastern Ontario and one for Western Ontario. At this time the factories that desired assistance were required to pay \$10 to the Department of Agriculture for the services rendered. This did not cover quite one-third of the total outlay of over \$23,000 for the season. The factories were arranged in syndicates or groups and each instructor was held responsible, through the chief instructor, for the work of his district.

In 1906, the Provincial Legislature passed an Act requiring that all cheese factories and creameries be



THE BLOOMFIELD CHEESE FACTORY, PRINCE EDWARD COUNTY

product. In 1880-81-82 the Dairymen's Association of Eastern Ontario employed another specialist from New York to undertake similar work in Eastern Ontario. The work of instruction was assisted and encouraged by the Dairymen's Association, which received grants from the Provincial Legislature, until in 1904 the work had assumed such large proportions that the Department of Agriculture decided to relieve the Dairymen's Associations of the financial burden, and made an appropriation to cover the salaries of thirty-two regular instructors and two chief instructors,

kept in a clean and sanitary condition. Two inspectors were appointed to enforce this law with the result that much improvement was made in the sanitary conditions, whey tanks, floors, drainage equipment and general surroundings of the factories.

The season of 1907 witnessed another decided step in advance. Up to this time the factories and creameries desiring the services of instructors were required to pay a portion of the expenses connected therewith. The weakness in this system was that the factories most in need of assistance,

and those which could not afford to engage a high-priced maker, were the ones which did not receive assistance. It was, therefore, decided by the Department to assume the whole financial responsibility and give instruction to all factories and creameries without making any charge whatever. This placed the instructors in an independent position, which they did not enjoy before. It can easily be seen that when the factorymen were paying a portion of the expenses of instruction, that the instructors hesitated to make demands or offer suggestions which they would have made had they been entirely independent. Then again the poorer factories received the same attention as the larger and more prosperous ones, with the result that a greater uniformity was established than was found possible under the old system.

Some 187 factories in Eastern Ontario and a few in Western Ontario received instruction in 1907 for the first time. The regular instructors were clothed with the power of sanitary inspectors, which proved of great assistance in having the sanitary conditions of the factories improved. Heretofore they had been in a position only to make suggestions and requests; now they were empowered to insist upon those improvements and alterations which were necessary to place the premises in a sanitary condition.

At the present time the 998 factories and 164 creameries in Ontario are divided into 26 groups of factories and 4 groups of creameries with an instructor in charge of each district. The number under the charge of each factory instructor varies from 35 to 45, while each of the creamery instructors have, on the average, 41 creameries to look after. It is the aim of the cheese factory instructors to call at each factory once a month, and where special assistance is necessary they make more frequent visits. If the quality of cheese is quite up to the mark and the maker is apparently having no

difficulty, then the instructor makes only a call visit. If he thinks it necessary to remain at the factory for a greater part of the day he, of course, does so. In the case of the creamery instructors, the various manufactories being more scattered, and the numbers greater for each man, it is, of course impossible to make a call each month. If a request comes for special assistance, the instructor in charge responds at the earliest hour possible. Reports are sent to the chief instructor every week, and he in turn sends such directions and suggestions to the instructors from time to time as he deems necessary, and endeavours to accompany each instructor on a few of his visits during the season. The report forms which are appended will indicate the nature of the information left with the factorymen, a copy of which is sent to the chief instructor.

When time permits, the instructors visit the producers, especially those who are not furnishing raw material up to the standard desired. Among other duties the instructor makes occasional butter fat, sediment and curd tests of the milk as delivered at the factories.

The instructors are first chosen because of their qualifications as successful makers, and in addition each must be a graduate of a dairy school. The term of employment for the instructors is from April to November, inclusive, while the chief instructors are permanent employees of the Department. It is customary each season just before the work of inspection begins to give a special course of from three days to a week to the instructors at the Guelph and Kingston dairy schools.

The work of instruction has, no doubt, been a large factor in developing uniformity and establishing a high standard in the cheese and butter industry of the province of Ontario.

The following are the report forms used by the instructor on regular visits to cheese factories and creameries, respectively:

REPORT OF DAIRY INSTRUCTOR AND SANITARY INSPECTOR.

Name of Factory			of	Township, County of.
In	Miles.			
Board sold on				Brand.
President				P. O.
Proprietor				P. O.
Manager				P. O.
Maker				P. O.
Secretary				P. O.
Salesman				P. O.
No. of Patrons	No. of Patrons Visited			Milk received } to-day, lb. }
No. of cheese made to-day		No. made same date last year.		
Condition of	Acidity			Flavour...
	No. of Sediment Tests made.			General..
Milk				
Condition of Culture				
Curd Tests made	Good	Tainted	Fat on milk	% Loss in Whey . % Fat
Condition of Cans			No. unfit for use	
Quality of Cheese	Flavour.			
	Closeness			
	Colour			
	Texture			
	Finish		Are Cheese turned in Hoops	
Condition of Curd				
Stage of Manufacture				
at time of visit				
Age of Cheese on hand	No.	Weather conditions and Temperature		
General appearance of factory	Outside.			
	Inside			
Make Room	Kind and Condition of Floors			
	Condition of Vats, Presses, Drainers and General Utensils			
Curing Room	Condition			
	How Constructed			
	Ordinary or Cool-curing	Temperature		
	Source of Supply			
Water supply	Location			
	Condition of Water			
	Manner of Disposal			
Sewage	Kind and Condition of Drains			
	Condition			
Boiler Room	Boiler inspected			
	Location	Covered		
	Of what constructed			
Whey Tanks	Cleanliness			
	Is Whey properly Pasteurized?	Condition		
	%Acidity of Whey in Tank.	%Fat in Whey Tank		
Appearance of Maker and Assistants				
Remarks				
Recommendations				
The above recommendations must be carried out not later than				
Copy of Report given to.				
Date.				

Instructor.

ONTARIO DEPARTMENT OF AGRICULTURE.
REPORT OF DAIRY INSTRUCTOR AND SANITARY INSPECTOR.

GEO. A. PUTNAM, Chief Instructors and Sanitary Inspectors:
 Director of Dairy Instruction, G. G. PUBLLOW, Kingston.
 Toronto, Ontario. FRANK HERNS, London.

CREAMERIES.

Name of Creamery.....			
In Miles.....	of.....		
In Township, County of.....			
Proprietor or President.....	P. O.....		
Butter-maker.....	P. O.....		
Secretary.....	P. O.....		
Salesman.....	P. O.....		
No. of Patrons.....	Pounds of Butter made preceding week.....		
Per cent. of Fat in Cream.....	Style of Package.....		
Are Scales or Pipette used.....			
Method.....	{ Tanks, large Cans, individual Cans.....		
Of.....	{ Their condition.....		
Collecting.....	No. unfit for use.....		
Condition of composite samples.....			
Methods of sampling Cream.....			
Is Cream Pasteurized.....	Method.....		
Pasteurizing Temperature.....	Time held at Past. Temp.....		
Condition of.....	{ Temperature.....	Acidity.....	
Cream when.....	{ Flavour, etc.....		
Received.....			
How is Cream Cooled at Creamery.....			
Is Culture used.....	Kind.....		
% Over-run preceding month.....	Acidity of Cream.....	Temperature of { Wash Water.....	
		{ Cream.....	
Churning.....	Per cent. of Fat lost in Butter-making.....	Remarks.....	
No. of Tests made for.....	Salt.....	Percentage of { Salt.....	
	Moisture.....	{ Moisture.....	
	Flavour.....		
Quality of.....	Grain.....	Moisture.....	
Butter.....	Colour.....	% Salt Retained.....	% Salt Used.....
	Finish.....		
General Appearance of Creamery.....	{ Outside.....		
	{ Inside.....		
Method of sewage disposal.....			
Water supply.....			
Condition of Creamery, Churn, Cream Vat, and General Utensils.....			
Floor.....	{ Kind.....		
	{ Condition.....		
Is the Butter-milk Tank clean.....	Where located.....		
Temperature of Refrigerator.....	Degrees.....	Condition.....	
Engine Room.....	{ Condition.....		
	{ Boiler inspected.....		

REMARKS AND RECOMMENDATIONS

The above recommendations must be carried out not later than.....
 Copy of Report given to.....
 Date of visit.....

Instructor.

MANITOBA

BY J. W. MITCHELL, B.A., DAIRY COMMISSIONER

IF the dairy industry of a province is to meet with any permanent success in its growth and development, an increase in output is not enough in itself, but must be accompanied by a steady improvement in quality of product. In our work in Manitoba we have aimed to keep this two-fold object in view and to impress its importance upon all connected with creamery and cheese-factory work, whether as patrons, officers or makers.

There are thirty-six creameries and twenty-two cheese-factories in operation in Manitoba this year. The creamery is much larger than the cheese-factory side of our dairy industry, but the latter as well as the former is steadily growing. In 1915, we made nearly six million pounds of creamery butter as compared with half this quantity in 1912, while we made considerably over seven hundred thousand pounds of cheese in 1915 as compared with about four hundred thousand pounds in 1913.

The dairy staff of the Department of Agriculture includes a dairy commissioner, two creamery instructors, one cheese-factory instructor, and a dairy produce grader. Each member of the staff has had a thorough dairy school training and wide experience in factory work, teaching, and instruction work.

As the creamery side of the dairy industry is, as already indicated, the large side of it, we shall limit what we have to say regarding improvement in quality to this side of our work. Though falling much short of what we should like to see it, yet there has been a decided improvement in the quality of our creamery butter during recent years, and this has not only enabled us to secure a firm hold on our home market and materially improve our standing in the outside markets, but, in addition, has stimulated the

growth of our dairy industry through enabling us to obtain satisfactory prices.

We would briefly outline the main factors to which we would attribute the improvement that has taken place in the quality of our butter.

GRADING OF CREAM AND PAYING FOR IT ON THE BASIS OF QUALITY

The common practice amongst our creameries is to grade cream and pay for it on the basis of quality. The following are the grades adopted at the beginning of the present season:

Extra First Grade.—Cream that is both sweet and clean in flavour.

First Grade.—Cream that is slightly sour but clean in flavour, and smooth and even in consistency.

Second Grade.—Sour or sweet cream, which is slightly stale, old, or bitter, or otherwise slightly defective in flavour, but of a smooth, even consistency.

The differences in price are two cents per pound of fat between extra first and first, and three cents between first and second grades. Cream below second grade is termed "Off grade" and is either rejected or paid for in accordance with its value.

Cream grading has demonstrated the fact that payment for quality is the means of securing quality.

INSTRUCTION WORK AND BUTTER GRADING

Cream and butter grading have greatly enhanced the value of the work of the instructors, and created an increased demand for their services. They and the dairy produce grader co-operate closely, and from week to week they visit the creameries where their services are most urgently needed. Each creamery reports to the produce grader each shipment of butter made, and the

produce grader, in turn, reports to the creamery upon each churning in the shipment.

Practically all butter exported is accompanied by the produce grader's certificate, and butter purchased for the home trade is paid for on the basis of quality.

WEEKLY CREAM GRADING REPORTS

The creameries report weekly to the Dairy Commissioner, upon forms supplied them, the number of cans of cream placed in each grade during the week. Thus we are kept informed as to the quality of the cream supplied to the creameries and are enabled, through comparison with the quality of the butter made, to judge of the efficiency of the cream grading work done at each creamery.

CONTROL OF CREAM RECEIVING STATIONS

During the past session of the Legislature, an Act was passed giving us a fair measure of control of cream receiving stations. Briefly stated, the purpose of the Act is to limit their operation to such stations as are suitably located, built and equipped, and in charge of a suitable man as operator. Amongst other things, suitable floors and drainage, screens for the doors and windows, steam for the proper cleaning of utensils, and proper facilities for cooling the cream and holding it at a

low temperature must be provided. The operator must satisfy the Department as to his ability to properly operate a station before a license will be granted him.

Properly enforced, this Act will greatly assist in the improvement of the quality of the cream shipped to our creameries through buying stations, and largely eliminate one great source of inferior cream.

PASTEURIZATION OF CREAM

Our own experience, and the experiences of others, have amply proven that the proper pasteurization of cream improves the flavour and keeping quality of butter, and we are encouraging its adoption in as large a measure as possible. Considerable pasteurization has been done this year, and it is our aim to work towards its general adoption as rapidly as possible. It means an addition to the cost of manufacture, but the advantages are so certain and so marked as to encourage our produce merchants to make a real difference in price between butter made from pasteurized and that made from unpasteurized cream.

The foregoing is an outline, in brief, of the means we have adopted to improve the quality of Manitoba Creamery Butter. We are hopeful of applying the grading system, in some form, in our cheese-factory work next year.

SASKATCHEWAN

BY F. H. AULD, ACTING DEPUTY MINISTER OF AGRICULTURE

SASKATCHEWAN'S methods for carrying on instruction and inspection work in connection with creameries and cheese factories will probably be found to differ materially from those in vogue in other provinces. The difference is due to the fact that more than two-thirds of the creameries are co-

operative institutions owned by the farmers and operated by the Dairy Commissioner for Saskatchewan at the request of the local creamery companies. There are no cheese factories in Saskatchewan. We have, however, a number of cream buying stations operated by retail merchants and designed to supplement the

purchases of cream for privately owned creameries operating in Saskatchewan and Manitoba.

The basis of all our improvement in dairying is the grading system, whereby all cream supplied to co-operative creameries managed by the Dairy Branch is graded and paid for on a quality basis, and all butter for export is sold on the grade certificate of expert graders employed by the Dairy Branch. This stimulus to improvement is an important factor in reducing to a minimum the inspection of creameries. The producer is stimulated to the production of the best quality of cream through the scale of prices paid for it at the co-operative creameries. The best quality brings the producer five cents per pound of butter fat more than is paid for the lowest grade. The creamery manager, who is an employee of the Dairy Branch, is stimulated to the best kind of service because the scale of his salary is to a certain extent dependent upon the quality and the quantity of butter which he makes. To make a highly creditable showing he must not only manage the creamery well, but must in addition take an intelligent interest in stimulating the patrons of his creamery to supply the best quality of cream.

The privately owned creameries are stimulated to make the best quality of butter because they have to buy cream in competition with creameries which pay a substantial premium for cream of the highest quality. As all their export butter is graded and marketed by the Dairy Branch there is the strongest possible incentive to careful management and the maintenance of sanitary conditions, without which high grade butter cannot be produced.

However, direct as well as in-

direct inspection and instruction is also a feature of the Government's work in connection with the dairy industry. The Dairy Branch employs four inspectors and instructors, one of whom is engaged mainly in the inspection and regulation of cream buying stations. The others visit the farmers and confer with them regarding the handling of their milk and cream, the feeding of their cattle, the testing of milch cows and the improvement of dairy herds. At present the outside staff is not sufficiently manned to enable all of the districts to have adequate service. The inspectors or instructors sometimes relieve managers of co-operative creameries by taking charge of their creameries for a few days to enable them to visit their patrons, but in the main the inspectors are "guide, philosopher and friend" to the producers rather than to the creamery managers who, through their daily and weekly reports to the Dairy Commissioner, enable him to keep so closely in touch with their operations from day to day that the necessity for closer inspection is largely obviated.

In Saskatchewan creamery buildings and their location are subject to the approval of the Minister of Agriculture, and as plans are submitted before a plant is constructed errors and subsequent difficulty arising from defective or unsanitary buildings or locations are avoided.

The assistance of Professor K. G. MacKay, formerly Assistant Dairy Commissioner, and at present Professor of Dairying in the Saskatchewan College of Agriculture, has been available to all creamery operators, and he has rendered valuable assistance in extension work in dairying throughout the dairy districts of Saskatchewan.

ALBERTA

BY JAS. MCCAIG, EDITOR OF PUBLICATIONS

THIS work is carried on in Alberta under the direction of the Dairy Commissioner. Instruction work has been carried on continuously since the Dairy Branch was established in 1906. The inspection work is provided for in Part II of the Act respecting the manufacture of butter and cheese (1907, Chap. 16), which gives the Minister power to appoint inspectors and fix their duties. The instructors were appointed inspectors under the provisions of the Act. The field work is done by two of these men, each covering the territory in which are situated one-half of the fifty-six creameries and fourteen cheese factories which are in operation.

The work of an instructor-inspector on inspection takes account of the following matters: creamery premises, equipment, working methods and quality of products. His report is based upon his findings in these particulars. The matter of reporting is more or less formal, while the assistance he is able to give for constructive and progressive improvement is regarded as the essence of value in his visit.

The instructors are men who have themselves had long experience as successful butter and cheese makers and in general factory management and business, and who have facility and natural ability for instruction work, either by practical demonstration, or by explanation of the scientific basis of manufacturing processes.

Each creamery and cheese factory is visited at least once a year. The number of visits to factories is determined wholly by the need in each case. On the whole, the butter and cheese makers are efficient and capable. The market verdict in products has a tendency to speedily eliminate the incompetent manager.

At each visit the inspector makes a report in triplicate upon his findings. One copy he retains, another he leaves with the butter or cheese maker in charge, and the third is filed in the office of the Dairy Commissioner. The form of report is shown on pages 128, 129, 130 and 131 of the Report of the Department of Agriculture for 1911.

Aside from the visits and the advice and assistance of the instructors and inspectors, the butter-makers have a good working ally in the Department's Butter Grading Service. The great bulk of Alberta's creamery butter production is now disposed of upon a grade basis. The creameries have their choice of selling subject to buyer's grade or subject to Government grade. The score-cards and grading reports of each lot of butter graded are, in the latter case, always sent back to the creameries where it is made and the butter-maker has a chance to see just where he is succeeding or where he falls short in meeting the requirements of his buyers, on the one hand, and the expectations of his patrons on the other. The latter expect, of course, to receive the highest price for the butter fat in their cream, and unless the finished product is of a high grade, the returns will not measure up to expectations.

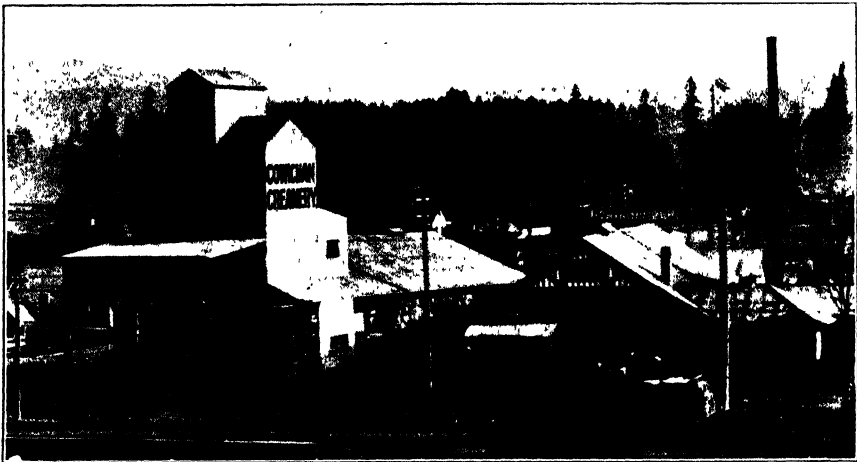
The annual short courses for creamery butter-makers may also be considered an important phase of our creamery instruction work. These courses are put on by the Department for one week at each of two points,—generally Edmonton and Calgary,—just before the summer season's business opens and such subjects as the grading of cream and butter, the pasteurization of cream, the testing of dairy products, butter making and general factory management are discussed and demonstrated.

BRITISH COLUMBIA

BY S. H. HOPKINS, B.S.A., ASSISTANT LIVE STOCK COMMISSIONER

THERE are as yet no cheese factories in the province, so that the work is confined to creameries, of which there are twenty-seven in British Columbia. Eleven of these are co-operative. The inspection work is carried on by the Dairy Division of the Provincial Live Stock Branch. Previously two men were engaged in this work in addition to their other duties; viz., H. Rive, B.S.A., and T. A. F. Wiancko. Mr. Rive now has leave of absence for active service over-

least once a year, and as many of the patrons of these as is possible. Two or three visits are made, if desirable. The co-operative creameries, being Government-aided, receive most attention. The inspectors, being practical creamery men are often able to help the maker in various ways, and this help is appreciated. The same may be said of the relations between patrons and inspectors. Conditions under which butter is produced show marked improvement each year, and the total production



COWICHAN CO-OPERATIVE CREAMERY, DUNCAN, VANCOUVER ISLAND

A successful enterprise located in a splendid dairying district.

seas. Both these men received their scientific training at the O.A.C., Guelph, subsequently being engaged in instructional work and in the management of commercial creameries, before joining the staff of the Department.

While their territory includes the whole province it may be pointed out that this part of their work is mainly confined to the Coast sections, twenty of the creameries being located in the Coast districts.

All the creameries are visited at

is increasing some 20 per cent annually. Creamery premises are found to be in good sanitary condition, and the product uniformly good.

The men engaged in cow-testing, in the several districts where cow-testing associations have been organized, help materially in their daily contact with the farmers. Reports are sent in on special forms annually to the Department by creameries.

Under an Act passed last Session

by the Provincial Legislature for the regulation of creameries and dairies, it is provided that:

1. No creamery or dairy shall carry on business without a license under this Act, and every creamery or dairy shall take out and from time to time renew and keep in full force and effect a licence under this Act.

2. No creamery or dairy shall permit any milk or cream to be tested save by an Inspector licensed under this Act.

3. Every creamery or dairy purchasing or dealing in any milk or cream shall deliver to the owner thereof, at such

time and in such form as may be prescribed by regulation, a just and true account of the amount and value thereof, certified by an Inspector licensed under this Act.

Regulations for the enforcement of this Act are now being framed. Inspectors appointed under this Act will be known as "Inspectors of Milk Product."

ANNUAL DAIRY REPORT

The following is the form of Annual Report sent in to the Department:

DEPARTMENT OF AGRICULTURE.

Dairy Division. Live Stock Branch.

ANNUAL DAIRY REPORT

Company	No. of Patrons.
Address	
Butter Manufactured, lb.	
Average price received	
Average price paid (fat)	
Whole Milk { Local	
{ Imported	
Sweet Cream { Local	
{ Imported	
Sour Cream	
Ice Cream	
Buttermilk.	
Eggs	
Ice	
Butter Imported	
(E. Canada (U. S. A.	
(New Zealand. (Australia.	
Gross returns.	

Secretary or Manager.

19....

Mr. J. W. Mitchell, B.A., Professor of Dairy Husbandry at the Manitoba Agricultural College, has accepted the position of Commissioner of Live Stock and Dairying in the New Brunswick Department of Agriculture, and was to enter upon his new duties early in November. Professor Mitchell is a graduate of Queen's University, Kingston. From 1896 to 1899 he was instructor of dairying at the Ontario Agricultural College. He then became dairy superintendent for the territory of Saskatchewan and Assiniboia, now the province of Saskatchewan. From 1901 to 1903 he was superintendent of the dairy work for the Dominion in the Maritime Provinces. For the ensuing five years he was at the head of the Eastern Dairy School at Kingston. In 1908 he again went west and remained there until he accepted his present position.

THE MOTOR CAR IN DISTRICT REPRESENTATIVE WORK

The motor car is proving an exceedingly valuable factor in District Representative work, in a number of the provinces. During these days of reduced staffs, it has been considered advisable to bring to the attention of those doing extension work, the various means that are being used to accomplish the maximum of results.

PRINCE EDWARD ISLAND

BY THEODORE ROSS, B.A., FORMERLY SECRETARY FOR AGRICULTURE

MOTOR cars cannot run in this province, except on three days of the week, and then only in very limited areas.

Consequently, they are not being used by the District Representatives in their work, nor are they likely to be for a time at least.

NOVA SCOTIA

BY M. CUMMING, B.A., B.S.A., SECRETARY FOR AGRICULTURE

TWO District Representatives in the province of Nova Scotia have motor cars; another has a motor cycle; and two of the field entomological men have motor cycles.

ADVANTAGES

When extension work in connection with the Department of Agriculture was commenced in the province, reliance for transportation of the men was placed almost entirely in the hiring of horse vehicles as occasion demanded. In the Island of Cape Breton when this system prevailed not only was the bill for horse hire a very large one, but the Representative was unable to get over as large an extent of territory as it was felt he should. Subsequently a motor cycle was purchased. This was an improvement, although it fell short, partly because it was impossible to carry such tools and implements as the County Representative often needed to use, and partly because of the strain on phy-

sical endurance. The following year a car was purchased, and the results were so satisfactory that the writer has no hesitation whatever in stating that every County Representative who has any considerable territory to cover should have a motor car at his disposal. With the use of the motor car not only has the Representative an opportunity to cover a large amount of territory, but he can proceed from place to place with rapidity and so answer calls for assistance in this way which he could never otherwise attempt.

COUNTY REPRESENTATIVE SYSTEM

Under the system of County Representatives as being developed in Nova Scotia, there is carried on a considerable amount of practical demonstration work on representative farms. For carrying out the details of this work it is often possible to secure the services of one of our college men who has not had sufficient experience to take charge of a whole county, but who merely re-

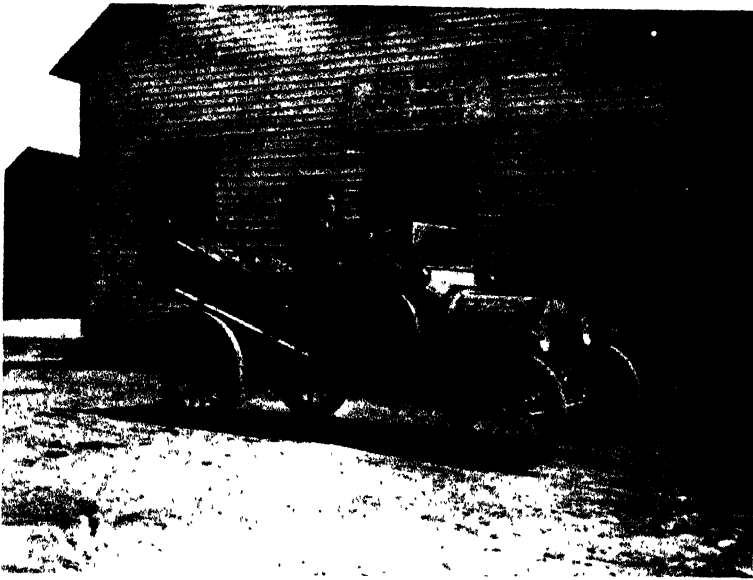
quires training to develop into an efficient man. With the aid of the motor car we have been able to make use of the services of quite a number of men of this class whose work can be easily superintended by the District Representative who has a car at his disposal.

In actual practice in Nova Scotia, we have in the case of the Island of Cape Breton, placed four counties under one head man who has had a large experience. He has assistants placed in each of these counties, but

Breton counties, starting on a trip. He is accompanied by Mr. Thomas Munn, who is Assistant Representative. It will be noted that in the car they are carrying a cultivator, drainage surveying instruments, and other implements which from time to time they will use in their demonstration work.

CREAMERY DEVELOPMENT

Incidentally this picture is taken in front of a Nova Scotia Government creamery, which is being oper-



MR. H. S. CUNNINGHAM, DISTRICT REPRESENTATIVE FOR THE FOUR CAPE BRETON COUNTIES, AND HIS ASSISTANT, STARTING ON A TRIP

Note equipment carried in the car

by the use of his car he is able to superintend their work frequently, and in this way is in a position to direct the policy for the whole four counties. This is satisfactory from every standpoint.

So useful has the car become in this connection that the writer does not see how the work could be carried on in the province without its use. The accompanying photograph represents Mr. H. S. Cunningham, Representative for the four Cape

ated in a part of Cape Breton where it was difficult to interest private enterprise. However, the creamery is being developed and in the course of a year or two will be taken off the Government's hands by a co-operative body of farmers. This creamery is run on the cream-gathering principle and taps some country fifty miles or more distant. The District Representative with his motor car has done a great deal in working up the business.

QUEBEC

BY F. N. SAVOIE, SPECIAL OFFICER, DEPARTMENT OF AGRICULTURE

THE automobile, as a means of locomotion, is daily becoming more appreciated by our District Representatives, owing to the rapid progress of agriculture, and owing to the necessity of saving time and money.

Very often during the busy time of the year, the presence of the Representative is required in several parts of the district in the same week. He would never be able to arrive in time if he had to wait for the train, or cover long distances by means of horse and rig. The automobile takes him rapidly and at his convenience. A trip which might require a day or two by horse and rig takes only a few hours by auto. Sometimes, the bad condition of the roads is an obstacle but this difficulty gradually disappears as our roads are improved.

The greatest objection to the use of the auto as a means of transport is that it is useless during the winter, at least for the province of Quebec. But the Representatives have few visits to make during the winter, and these visits rarely necessitate rapid travelling.

Only one of our Representatives has an auto; three others have motorcycles. They prefer the latter mode of locomotion to the auto, as the cost of maintenance is less and the motorcycle is lighter and passes more easily over bad roads. It is to be hoped that, before long, all our District Representatives will be using an automobile or a motorcycle. The idea is gradually spreading and the general adoption of this means of locomotion is only a matter of time.

ONTARIO

BY C. F. BAILEY, B.S.A., ASSISTANT DEPUTY MINISTER OF AGRICULTURE

UNTIL recent years the automobile has been looked upon as a luxury, but to-day its development has reached such proportions and the price has been so greatly reduced that it is becoming more and more used in commercial life. This latter development has extended to rural districts and to-day we find in some sections of the province that the farmer with a car is no longer the isolated exception. During the early development of the District Representative movement in Ontario, it was recognized that the automobile could be used to great advantage in the work; however, it was felt that its adoption should keep

pace with public sentiment. The first step toward the adoption of such a policy was taken in 1912, when the Waterloo county council purchased a car for the District Representative by making a special vote for this purpose. The following year the Department purchased several motorcycles for the District Representatives in larger counties; it was found, however, that they were unsuited to the work, apart from making special trips or doing inspection work, such as visiting farmers, etc. Since that time each office has been supplied with a car with the exception of a few of the New Ontario districts, where the distances are great and the

roads unfit for motoring. In order to insure local approval of the motor car in District Representative work, it has been the policy of the Department from the beginning to purchase all cars with county grant funds. (In every county where a District Representative is established, the County Council is required to make an annual grant of \$500). The gasoline, oil and repairs become part of the regular District Representative expenses and are paid through the Department. It is rather difficult to say just what kind of car is best suited for District Representative work, but our experience thus far seems to indicate that a 5-passenger car of a strong but inexpensive type is the most satisfactory, all things considered.

THREE DOZEN CARS

We have at present in the service some 36 cars of this description. Owing to the fact that we have this number of cars in the District Representative service in addition to others in the Department, arrangements have been made with a reliable tire company for the purchasing of tires at a wholesale rate. This has resulted in the Department securing tires at a very reasonable figure. Plans are under consideration for the installation of five-barrel gasoline tanks and pumps in connection with every District Representative office; the gasoline will be purchased at wholesale rates, and it is possible that a mixture of half gasoline and coal oil will be used for running cars in the service. We have reason to believe that this mixture will give good satisfaction with cars not running over 30 miles

per hour, and if such is the case it will reduce the cost of operation very considerably.

THE MILES THEY COVER

The number of miles covered by a car in each county each year varies somewhat, as some of the counties are much larger than others and not so well served by railways. However, 5000 miles per year would be a fair average; in other words the District Representatives in 36 counties cover about 180,000 miles each year. The cost of upkeep also varies to some extent, depending upon the care the car receives and the condition of the roads in the county.

In estimating the value of the motor car in District Representative work, one should not compare the cost of operation with horse livery. It has been fully demonstrated that the motor car has made it possible for the District Representatives to do at least one-third more work in a given time. In fact, we have cases on record where they have covered in two days what would take a week under the old system of travelling. It is also found that much less travelling has to be done by rail and thus railway fares and often hotel expenses are saved, not to mention time lost by unsuitable railway connections. Moreover, in some of the larger counties, poorly served by railways, the District Representative is enabled to reach sections of his county with comparative ease. There is no doubt that the motor car is filling a very important place in agricultural extension work in Ontario and it should be equally as useful in other provinces of the Dominion.

FARMERS' AUTOMOBILE TOURS

Two farmers' automobile tours were carried out in Ontario during the past summer. They were organized by the District Representatives in Dufferin and Victoria coun-

ties. The former was the second annual tour of farmers from Dufferin county and was organized by Mr. H. A. Dorrance, B.S.A., District Representative for that county. The other

tour was carried out by Mr. A. A. Knight, B.S.A., District Representative at Lindsay. These trips are planned for the purpose of giving the farmers first-hand information as to conditions on what are recognized as the best farms in various portions of Ontario.

DUFFERIN COUNTY

The Dufferin county farmers' tour lay through the counties of Wellington, Halton and Brant. The party, numbering some forty odd, was conveyed in automobiles all owned by farmers. The party met at "The Maples", the home of the Hunter Herefords, where they were shown over a well-cared for and noted breeding establishment, on which is kept an extensive and carefully selected herd of white faces. Here, as was done at all the various stops, the owner pointed out the important points regarding his favourite breed.

The next stop was made at the farm of Geo. Fletcher of Binkham. Mr. Fletcher has a well-planned homestead and specializes in Shorthorn cattle, Oxford sheep and Clydesdale horses. An interesting hour was spent on this plant studying beef type.

Going by way of Erin the party proceeded to the Guelph prison farm, where they were shown the various features of interest including an extensive herd of high-grade Holstein cattle.

The next stop was made at Woodlands Farm, the property of Messrs. Ralph Ballagh & Son. This farm specializes in Brown Swiss cattle, Hackney and Clydesdale horses and Shetland ponies. The Brown Swiss resembles the Jersey in colour, but in size is much larger. The owner reports them profitable as beef and milk producers.

From this point the party was taken to Hamilton. The trip was resumed at Burlington with W. F. Strong, District Representative for Halton County, as guide. Mitchell

Bros.' herd of Shorthorns was the first point of interest.

The next stop was made at the Pettit Farm. This Shorthorn herd, established many years ago by the late W. G. Pettit, contains a large number of high class specimens of imported and Canadian bred animals.

Proceeding, the road was taken to the Lakeview Farm owned by Major Osler. This farm is maintained as a breeding establishment for Holsteins, Clydesdales and Yorkshires, and is well equipped. Large and commodious barns of the most modern type house the animals in comfort. The chief interest, however, on this farm is the herd of high-producing Holsteins. Many of the animals in this herd hold certificates of the Canadian Record of Performance. Considerable time was spent in looking over and discussing features in connection with particular animals and dairying generally.

The Fisher orchards, near Burlington, provided the next stop. Some one hundred and twenty-five acres are under fruit of various kinds. This is one of the largest fruit farms in the locality and is managed and cared for in an up-to-date manner. The party then proceeded to Brantford, where visiting was resumed under direction of R. S. Schuyler, District Representative for Brant county.

Proceeding along the Grand river through a most prosperous country the farm of Jas. Douglas, Caledonia, was reached. This farm, which maintains a high class herd of Shorthorns and flock of Leicester sheep, has been in continuous operation since 1855. This farm is noted for its alfalfa crops. The visitors learned from the owner important points to be observed in growing this important crop. A feature of the trip took place here in the reading of an address from the excursionists to Mr. Dorrance, and the presentation of a handsome signet ring as a token of appreciation for his arrangement and management of the tour.

From this point the Riverside Farm of J. W. Richardson was reached. This farm won first prize in the "Farm and Dairy" farm competition of some years ago. The owner specializes in Holsteins. Mr. Richardson described some of the more important features in connection with the herd management.

The next and final visit of the trip was to the Oak Park stock farm, the property of Messrs. Bailey and Son. This is one of the best equipped farms in the province, at one time being considered as a suitable location for the Experimental Farm. The proprietors specialize in Holstein cattle and Shropshire sheep, fine collections of both being maintained.

Disbanding here, the party proceeded home by way of Paris, Galt and Guelph, passing through some beautiful country. The tour was most successful, and as an annual affair is becoming very popular, providing, as it does, a pleasant outing and, at the same time, giving the farmers of this county first-hand information regarding the various problems with which they have to deal as well as giving them new ideas and stimulating their ambition.

VICTORIA COUNTY

The Victoria county farmers' tour lay through the counties of Peterboro and Hastings. Owing to the late season and subsequent backwardness of farm work, only five cars were

entered in the excursion. Mr. Knight, District Representative, hoped to have ten cars enter the tour, which number he considers the maximum for a successful tour, as more than this number would cause undue delays and difficulty in keeping the party together.

The trip was planned through the counties of Peterboro, Hastings, Prince Edward, Northumberland, and Durham. Three hundred and thirty-five miles were covered in the three days, which proved to be too much. The drivers came in at night tired out, and, in addition, stays at the different farms had to be cut short in order to reach the place arranged for over night.

The District Representative in each county met the party at a convenient point and acted as pilot through his territory. This proved an excellent arrangement.

It was essentially a dairymans' trip, as it was through a dairy district, practically all the farmers visited making dairying their specialty. Calls were made at the farms of Jos. O'Reilly, G. A. Brethen, B. Hagerman, Mr. Phillips in Prince Edward county. Purtelle and Leavens, A. D. Foster & Sons, Fred Mallory and D. B. Tracey. In addition to visiting farms, the party did as much sight-seeing as possible in the territory through which they passed. Altogether the trip was most enjoyable and should prove profitable to the tourists.

SASKATCHEWAN

BY F. H. AULD, ACTING DEPUTY MINISTER OF AGRICULTURE

THERE are at least two main points of advantage in using motor cars in extension service, one being the freedom of movement it gives and the other the time that can be saved. One can go with a car when and where one wishes independent of railway lines and of livery service, the latter often being very inefficient and unsatisfactory. The work of a District Representative takes him out

in the country among the farmers, and it would be a great handicap to have to depend on train and livery service even though both were efficient. A saving in time is effected not only in the speed one can travel with a car, but also in that one can move on from point to point as soon as the work is done without having to wait several hours for the train. This last is an important point in any territory.

Travelling by motor is much cheaper than by livery, especially when the time saved is taken into account. With ordinary care the expenses on a Ford car need not be heavy for repairs or operation. The distribution of seed and other supplies to country schools, etc., can be done much more conveniently and quickly with a car. When talking over farm practices, it is an advantage to be able to take the farmer for a tour around his fields with the car. In conducting a series of extension meetings the lecturers can be conveyed much more conveniently and cheaply than by livery. When visiting local officials, weed inspectors, agricultural secretaries, etc., a day spent driving over the territory with a car is of much more value than several days with a livery team and much less expensive. When attending organization and other important meetings the car has often been of assistance in making quick trips for some necessary papers, etc. The car enables an official to return to his centre more often and thus makes his work more efficient in that he can receive mail and answer the same without unnecessary delay. In other words he is more accessible to both his employer and his field.

The car overcomes distance and lowers travelling cost. By saving time and allowing of freedom of movement, and a more

frequent return to centre, it increases the efficiency of the District Representative, and hence his value.

These opinions were voiced by one of our District Representatives in Saskatchewan where the use of automobiles for extension work has been tried with good success in recent years. From the beginning of the District Representative service our men were provided with roadsters; while field representatives of the Department, game guardians and inspectors, who own autos, have for a couple of years past been paid an annual rental for their use for Government service.

The condition of the roads during periods of heavy rainfall tends to reduce the efficiency of the car, but when all the facts are considered the automobile seems to be indispensable from the standpoint of the man whose duties require a personal interview with the farmer on his own farm.

RURAL ORGANIZATION

In a small way some foreign settlers are attempting to transplant the manner of life to which they have been accustomed in the home-land. For example, in a little Jewish community in Northern Manitoba, four families have built their homes at the four adjoining corners of their homesteads. A schoolhouse has been built on two acres of land donated by two of the farmers. A public bath is located on one-half an acre of land donated by one of these farmers. A night-school was maintained last winter. As the community feeling is strong, other neighbourhood organizations are to follow. One mile north, one mile south and one mile east of this are other similar clusters of homes. The local schoolmaster, himself a Jew, who has had wide experience in Russia and Austria, as well as in various foreign settlements in Canada, is enthusiastic over the village scheme. He suggests that each township should be divided into four "village communities." The village with its school and social hall and blacksmith shop and other community institutions would be located in the centre. Several acres would be reserved for each family for gardening and pasturage. This village scheme may appear to us impractical and idealistic, but it is merely a modification of that to which many of our European immigrants have been accustomed. The social advantages are unquestionably great. The problem of isolation would be solved. The economic benefits would apparently more than offset the economic disadvantages. Neighbours could readily exchange work. One set of implements would in the early stages meet the needs of a number of families. Agricultural instruction could be readily imparted. Agricultural credit—an absolute essential in making a start on the prairies—could be granted under conditions not so very different from those in Quebec where the Co-operative People's Banks have been so successful.—J. S. Woodsworth, Director, *The Bureau of Social Research*, in "*The Farmer's Magazine*."

NOVA SCOTIA

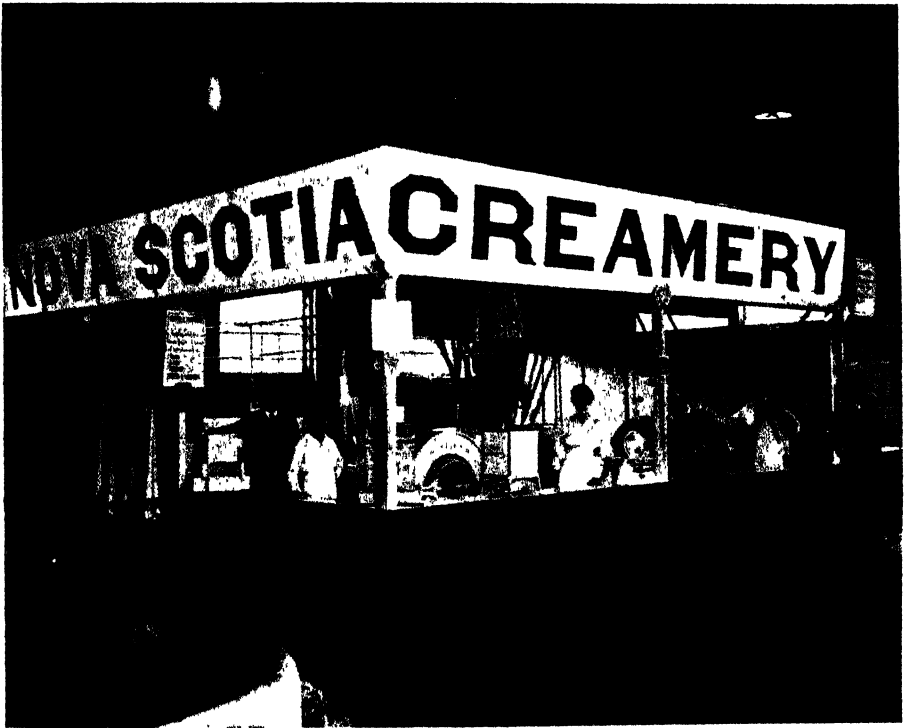
CREAMERIES BOOTH AT THE PROVINCIAL EXHIBITION, HALIFAX

BY W. A. MACKAY, DAIRY SUPERINTENDENT

AS promised in the September number of THE AGRICULTURAL GAZETTE, the Dairy Division of the Nova Scotia Department of Agriculture conducted a demonstration booth at the provincial exhibition, from September 13th to 21st, which was spoken of by the president of the exhibition as "most

The entire booth was finished in white paint and practically all the machinery was finished in white enamel. The operators were attired in white suits, giving the visitor, even at first sight, an impression of cleanliness.

Butter-making was carried on daily and the machinery was kept



THE NOVA SCOTIA CREAMERIES MAIN BOOTH AT THE PROVINCIAL EXHIBITION, HALIFAX, SEPTEMBER 13-21, 1916

attractive, instructive and entertaining."

The booth consisted of two parts, as per accompanying illustrations. In the main booth, a space of 25 by 25 feet was equipped with two complete outfits for the manufacture of butter on a cream-gathered basis.

in operation from morning to night. The butter was sold over the counter in parafine cartons, kept in a sanitary enamelled refrigerator, showing the consumer how properly made creamery butter ought to be handled through the stores.

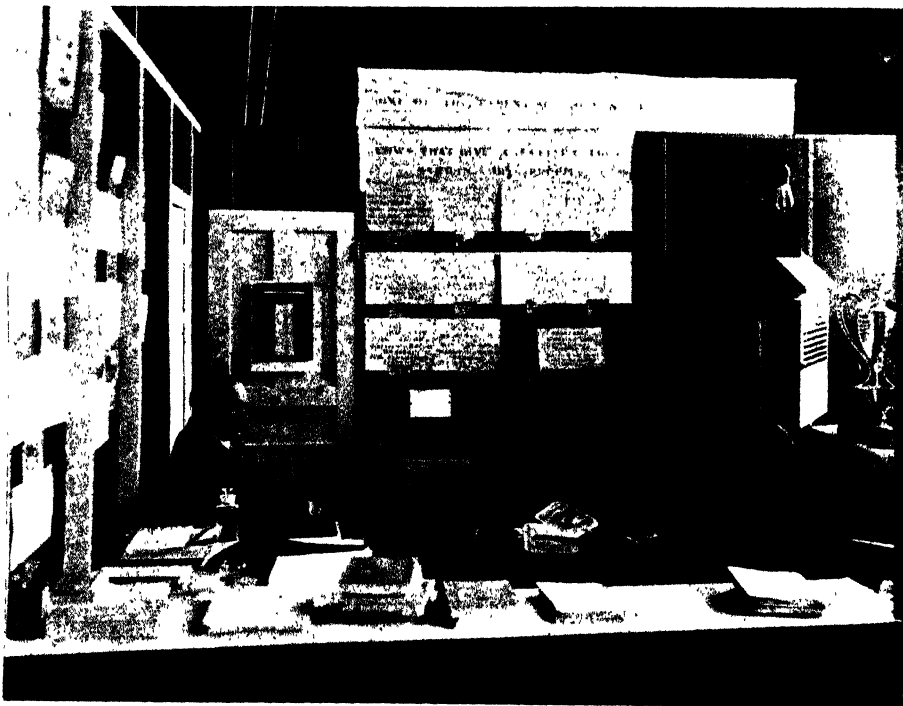
The buttermilk was also properly

cared for and sold over the counter in the best possible condition, also giving consumers an idea of how butter-milk should reach them.

These two features made the exhibit very popular and it was impossible to keep enough butter-milk on hand to meet the demand. Crowds of people could be seen at any hour of the afternoon thronging around to watch the machinery in operation.

used in the handling of milk and cream was also to be seen.

A popular feature of the demonstration was the small fans decorated on one side with a photo of the group of Nova Scotia creameries, and on the other side with some short paragraphs on what the creamery means. Photos of all the creameries which it was possible to get were put on the wall with a chart showing the development of the creamery



ADVISABILITY OF COW-TESTING WORK AND PROPER CARE OF MILK AND CREAM
CLEARLY DEMONSTRATED

TO MAKE DAIRYING A SUCCESS

In the office at the extreme end of the main booth, the walls were decorated with some of the essentials toward making dairying a success. Valuable bulletins on all phases of dairy work were passed out by the writer and by officials of the Cow-Testing Association work of the Department of Agriculture at Ottawa. A full line of equipment

business in the last ten years, which showed in 1916 an increase of approximately 1066 per cent over 1907.

The complete staff consisting of from five to eight were kept busy during the entire exhibition in explaining the working of the different machines, and in disseminating information in connection with creamery work.

QUEBEC

MACDONALD COLLEGE

EXHIBIT AT SHERBROOKE FAIR

BY JAMES MURRAY, B.S.A., PROFESSOR OF CEREAL HUSBANDRY

THE Great Eastern Exhibition held at Sherbrooke, September 2nd to 11th, was again utilized by Macdonald College to bring before the thousands of visitors some of the work that it is carrying on in the interests of agriculture in Quebec.

The exhibit was staged in one of the wings of what is known as the Transportation Building and occupied about 1,400 square feet of floor space and about 1,000 feet of wall space. This was divided among six of the college departments whose work is to a greater extent than the others concerned with the everyday practices of the farm. In arranging the exhibit an effort was made to direct attention to only two or three features of each department's work and to emphasize those that the season made particularly applicable.

The central space was occupied by the contribution from the Agricultural Engineering Department — a demonstration of the operation of tile drains, namely, two fields represented by galvanized iron trays 8 x 6 feet, about a foot deep and full of soil. Equal amounts of water were applied to these fields and from one the surplus was removed by means of a system of under-drains with the outlet in plain view and showing the water running away. The drained field gradually dried on the surface while the other remained sodden and water logged. The illustration attracted no little attention and served to point the way to many spectators to increased yields and earlier maturing crops. A more general appreciation of the value of tileing is

badly needed in this province, and such demonstrations as that mentioned should start at least a few thinking.

The Animal Husbandry exhibit centred around the sheep industry. Quebec is one of the few provinces in which, during the past few years, sheep have been increasing in numbers. The progress here, has been due in large measure to the aggressive campaign carried on by this department. A number of models were shown illustrating good types of sheep barns, dipping tanks, feeding racks, etc. These were accompanied by directions for building and the approximate cost. The composition of rations for different purposes was clearly shown by means of glass bottles containing the various ingredients. Many other object lessons of value to the sheep farmer combined to form an attractive and instructive display.

The Biology Department had a small but useful exhibit. It consisted mainly of specimens of injurious insects, fungous diseases and weeds. Of itself the exhibit might have conveyed but limited information, but a well-informed attendant was prepared to answer questions relating to the subject or to furnish literature dealing with particular problems.

The Cereal Husbandry Department's contribution to the exhibit dealt most particularly with roots and hay crops. By means of charts and specimens an effort was made to show the great advantage of sowing roots early, and of thinning at the proper time. The loss from two

weeks' delay in sowing mangels was no less than 16 tons per acre or an equivalent in feed value of nearly 100 bushels of oats. The losses from three weeks' delay in the sowing of swedes was 15 tons per acre; and from three weeks' delay in thinning swedes, 4 tons per acre. Samples of roots produced from improved home-grown seed were compared with those from commercial seed to show the advantage of producing seed at home. The figures given were the average results of 5 years' experiments at the college. In the hay crop section emphasis was laid on alfalfa. This is by no means an important crop in Quebec at present, but so much money has been lost in attempting to grow it that it was considered advisable to point out the chief reasons for failure and the practises necessary to insure success. Among the essentials to successful growth, as illustrated on a chart, are, —a hardy variety, well drained soil, an application of lime and land free from grass.

The cereal exhibit also included samples of the best varieties of cereals both in the straw and threshed, and of corn, grasses and clovers. A number of photographs taken in the departmental grounds aided in bringing out many lessons that could not otherwise be illustrated and served at the same time to improve the general attractiveness of the display.

The exhibit of fruit installed by the Horticultural Department was one of the most attractive features not only of the college exhibit, but of the whole exhibition. An exhibit of ninety boxes of large, clean, highly coloured Duchess apples makes an attractive display at any time, but in a season such as this has been, when high class fruit is difficult to find, it calls forth more than the usual admiration. It served as an excellent object lesson of the advantages of judicious pruning and thorough spraying. An even better demonstration along the same line

was made by showing in adjacent piles the produce of two trees of Fameuse. Both trees were the same age, growing in sod, but one was properly fertilized and pruned and thoroughly sprayed while the other was unfertilized, indifferently pruned and insufficiently sprayed. In the one case the crop was heavy, the fruit of good size and free from insect and fungous injury, practically all grading No. 1; in the other the crop was light, and nearly all of No. 3 fruit with a small proportion of No. 2. Large placards gave full particulars regarding the treatment of the two and the result in dollars and cents. The lesson was too plain to be missed.

The Poultry Department contributed an excellent educational display. Models of poultry houses, trap nests, fattening crates, etc., were shown with placards explaining their construction and uses. Emphasis was laid upon the need for improvement in methods of marketing eggs. Eggs properly graded in a good type of package were displayed in comparison with ungraded eggs as ordinarily marketed, greatly to the disadvantage of the latter. Attention was also directed by means of charts to the best types of fowls for various purposes, proper methods of dressing and packing market fowl, etc.

Most of the departmental exhibits had a well-informed attendant throughout the duration of the fair to explain and elucidate the exhibits and to answer questions of interested spectators. To aid in the dissemination of useful information the following circulars were prepared for general distribution:—

Macdonald College: general information.
Treatment for smut.
Root growing in Quebec.
Control of some noxious weeds, fungous diseases and insect pests.
Egg production in Quebec.
Alfalfa growing in Quebec.
Select list of fruits, vegetables, trees, shrubs and flowers.
The care of the apple orchard.
Sheep-raising.

These circulars were all of four pages and contained only concise definite information presented in readable form. They were found very useful

to hand to those who appeared interested in any feature of the exhibit.

SALE OF PURE-BRED SHEEP AND SWINE

BY H. BARTON, B.S.A., PROFESSOR OF ANIMAL HUSBANDRY

THE sale of pure-bred sheep and swine, held at Macdonald College on October 6th was quite successful. Representatives of five breeds were offered including Oxfords, Shropshires, Southdowns, Leicesters and Cheviots. Shropshires and Southdowns seemed to meet the greatest demand. The highest price of the sale was obtained for a Southdown yearling, being \$76. This ram, together with a number of ewes and lambs, was purchased by Mr. Walker, shepherd at Heart's Delight Farm, Chazy, N.Y. A number of the Southdown ewes sold for prices ranging from \$30 to \$40 each. One shearling Leicester lamb sold for \$45, as did also a shearling Oxford. A number of Shropshire ewe lambs, all of which were of good type and quality, sold for prices ranging from \$20 to \$25 each. Very few Cheviots were offered but one pair of ewe lambs sold for \$30 each and one other at \$25.

On the whole it might be said that while a larger attendance might have been expected, the demand evidenced and the range of prices indicated a very healthy condition of the sheep industry in this province. It might be said for Quebec that when private

buyers are willing to pay in the vicinity of \$50 for rams and \$25 to \$30 for lambs for use in their own farm flocks, that the sheep industry is certainly in a different position to that which it occupied even a short time ago.

In the case of the pigs the demand was not so ready; apparently the high price of feed is curtailing swine operations, if the sale could be taken as an indicator in any sense. A number of very nice Berkshire sows in the vicinity of a year old sold for \$35 to \$40 each, while a number of boars fit for service received little demand. A smaller number of Yorkshires were offered for sale and with a few exceptions brought fair value. A very nice selection of Chester Whites went out at very little better than pork prices.

A better sale of the pigs was expected, but when it is considered that this is perhaps the first sale of sheep and swine exclusively, and without special facilities for purchase, to be held in the province, and therefore a somewhat new thing, it would seem that such means for sale and distribution of stock of this class might well be developed.

A farmer near Selkirk, Man., sold the whole of his hundred acre wheat crop for \$1.64 per bushel. This was early in September. The wheat graded No. 1 Northern and ran 25 bushels to the acre. At the time the price paid was a record.

ONTARIO

ENCOURAGEMENT TO SHEEP RAISING

BY W. BERT ROADHOUSE, DEPUTY MINISTER OF AGRICULTURE

THE Ontario Department of Agriculture has just entered upon the initial steps of a plan with a view to further encouraging sheep raising in the province, particularly among young men. Thirty good grade ewes have been purchased and are being assembled at the Ontario Agricultural College, where they will be bred before being distributed. They will then be placed with five young farmers, each taking six sheep. The men to take the sheep will be chosen from among those who have attended the courses in agriculture under District Representatives, and will be selected after competition in sheep judging. They

will be expected to follow instructions in the care and handling of the sheep and to give a report from time to time as to methods and results. After the first year they will also be required to give back two lambs, and two more each of the two following years, so that they will thus give back as many as have been placed with them. These in turn will be placed with other young farmers and thus constitute an increasing chain of demonstration flocks.

The plan is being carried out under the direction of the Live Stock Branch in co-operation with the District Representatives.

MANITOBA

THE POULTRY MARKET SITUATION

BY M. C. HERNER, PROFESSOR OF POULTRY H SBANDRY, MANITOBA AGRICULTURAL COLLEGE

PREDICTIONS for high prices for poultry this fall have been well maintained. They have been even higher than was anticipated. Owing to these high prices and scarcity of feed, there exists a tendency on the part of farmers to dispose of their poultry on the first opportunity that comes, without first properly finishing them. A practice that is altogether too prevalent this fall is that of hucksters going round the country and buying up the poultry at prices that do not represent market values at all. These hucksters buy at the cheapest price possible, and then place the fowls on the market in any condition at all. This method of marketing

poultry must be condemned by us, as it robs the farmer of his just returns and lowers the standard of the dressed poultry trade in general. Cash at the farmer's door is a good inducement to sell; but he is simply losing from ten to thirty cents upon each chicken sold in this way to a huckster this fall. Farmers are inclined to jump at the prices offered by these men, not knowing that the market price is really a good deal higher. These men are not going round the country gathering up poultry for the fun of it. There is money in it for them, and pretty big money too. A note of warning is sounded at this time about this practice.

Another alternative is for farmers to themselves fatten the chickens before selling them and in this way get better prices. Scarcity of feed, lack of time, and probably in some instances not high enough prices form the chief objections to fattening chickens on the farm.

But there is still another alternative; and that is to have the chickens fattened on a co-operative basis. This method of handling farm chickens was adopted by the Poultry Department of the Agricultural College, Winnipeg, last year, and seemed to be so successful that the farmers who tried it wanted the same work carried on again this year. Last fall upwards of 1,600 farm chickens were fattened and then sold at an average of almost one dollar each. So far, (October 6th) this fall, 1,000 chickens have been sent in, as well as quite a few turkeys. The first lot of 21 chickens, weighing 98 lb., was received September 8th, and fattened until September 27th, at which time they dressed out 111 lb. They were sold at 25c. per lb., a total

of \$27.75, or approximately \$1.30 each. Figuring the cost of handling at 20 cents (feed and labour are both higher this fall than last) per chicken for feed, labour and incidentals, this still leaves a balance of \$1.10 per chicken.

These prices may not be maintained all fall, but still the spread between rough, unfinished stock and stock properly fattened will remain about the same. The same gains may not be made with all chickens, but on the whole the product is always improved to such an extent as to make the work highly profitable for the farmer.

Farmers are asked to observe the following rules in regard to this co-operative fattening work:

1. Do not ship in any chickens or turkeys until arrangements have been made with the Poultry Department.

2. Ask the Poultry Department, Manitoba Agricultural College, Winnipeg, for circulars outlining the work.

EXPORTING FEEDERS AND STOCKERS

DURING the months of August and September, this year, 11,872 cattle, from 60 to 75 per cent of which were unfinished feeders and stockers, passed through the Union Stock Yards at St. Boniface, Manitoba, en route for the United States. While the fattened animals go to the United States abattoirs for killing, there are trainloads upon trainloads of yearlings and two-year-olds, both sexes, raised on the farms and ranches of Western

Canada that will be purchased by farmers of the United States for feeding and breeding purposes. Roughly these animals will cost the American farmer two cents per pound more than they will be sold for by the Canadian farmer who has raised them. The Manitoba Department of Agriculture is strongly urging farmers of this province not to ship away the unfinished young animals, but to fatten them into good beef at home.

AGRICULTURAL COLLEGE APPOINTMENTS

The following new appointments have been made to the staff of the Manitoba Agricultural College: Miss H. Dowsell has been made Assistant Professor in Household Science. Miss McFadden, of Brandon, is to be Assistant Professor in Household Arts. Dr. J. W. Shipley will be Assistant Professor in Chemistry. F. H. Newcombe, B.S.A., will be a

new lecturer in Animal Husbandry. James H. Bridge, B.S.A., who has for some months been operating his own farm, will return to the College to resume his duties as Assistant Professor of Field Husbandry. Mr. Jesse Francis, an experienced poultryman, will be a new lecturer in the Poultry Department.

SASKATCHEWAN

DEPUTY MINISTER MANTLE KILLED IN ACTION

Major A. F. Mantle, Deputy Minister of Agriculture for Saskatchewan, has been killed in action on the European battle field. Mr. Mantle was born in London, England, on February 5th, 1882. He came to Canada in 1898 and engaged in farming in the province of Manitoba. In 1909, after serving for a year on the *Manitoba Free Press*, he became Secretary of the Department of Statistics of Saskatchewan and in 1910 became Deputy Minister of Agriculture for that province. Major Mantle was Honourary Secretary of the Agricultural Credits Commission for Saskatchewan in 1913 and also Secretary of the Grain Markets Commission. He was Chairman of the Stallion and Licensing Board and Director of the Winter and Summer Fair Boards at Regina. Major Mantle left a wife, two sons and a daughter.



THE LATE MAJOR A. F. MANTLE

ACTIVITIES OF THE PROVINCIAL DEPARTMENT OF AGRICULTURE

THE provincial Department of Agriculture has placed Mr. A. J. McPhail in attendance at the Union Stock Yards, Winnipeg, to advise and counsel Saskatchewan

farmers on the purchase and sale of cattle. An arrangement is also in force by which on the production of a certificate signed by the secretary of the local Grain Growers' Asso-

ciation; a twenty-five per cent reduction in the freight rates will be granted.

The annual meetings of the various breeders' associations of the province are to be held at the College of Agriculture, Saskatoon, from January 9 to 12. Arrangements are in progress for holding a convention in connection with the gatherings at which lectures and demonstrations will take place on subjects more or less common to all, such as sanitation, feeding, marketing and economic matters generally.

The provincial Department of Agriculture will repeat its co-operative poultry marketing project this fall, the period appointed for the purpose being from November 13th to December 16th, during which time two receiving and selling stations will be in operation, one at Saskatoon for the northern half of the province and one at Regina for the southern portion. Experts from the poultry department of the College will supervise the killing, plucking, grading and packing. Professor R. K. Baker, of the College, is in charge of the preliminaries, and to him inquiries are to be addressed. A monthly Bank Bulletin Circular has been issued in connection with this project.

The report of the provincial Bureau of Statistics for the year 1915, just issued, shows that the average yield of spring wheat per acre in Saskatchewan last year was 25.2

bushels, which is seven bushels higher than the average shown by any state of the Union, North Dakota coming the nearest with 18.2 bushels. The average of Saskatchewan for 10 years, shows a yield per acre of 7.1 bushels better than any state. In total production last year Saskatchewan exceeded any individual state by 21,753,775 bushels. A table in the report gives the results obtained from different methods of preparing the land. Four methods are compared namely, summer fallowing, fall ploughing, spring ploughing and sowing on stubble, and the result shows that in all four of the principal grains, but particularly so in the case of oats, by far the largest yields were secured from the summer fallow. In the case of oats, while the average yield was exceeded in the year 1909, the total production was over twenty million bushels in excess of any previous year. The acreage of barley was much reduced, but the average yield per acre was greater by three bushels than in any of the previous ten years, and the total production was only surpassed in the year 1913. Coming to the live stock industry, the report shows that in comparison with the year 1914 there were in round numbers 27,000 more horses; 20,000 more milch cows; 32,000 more "other cattle" and 15,000 more sheep in the province. Swine alone had a decrease.

George G. White, B.S.A., Professor of Farm Management and Rural Economics at the Manitoba Agricultural College, met with a fatal accident on October 10th while operating a tractor on his farm at Lasalle, Man. He was ploughing and was backing his engine to the plough when the seat broke and he fell between the lever on the plough and the lever on the engine, breaking his neck. Nobody witnessed the accident and the deceased had been in the tractor twenty-four hours before being discovered. Prior to appointment on the staff of the College, Mr. White was connected with the co-operative department of the Grain Growers' Grain Company. He bought the farm on which he was killed only a month ago.

PART III

Rural Science

AGRICULTURAL HIGH SCHOOLS

ONTARIO

BY J. B. DANDENO, Ph.D., INSPECTOR OF ELEMENTARY AGRICULTURE

AT present there are in the province of Ontario 10 high schools, 6 collegiate institutes and 5 continuation schools conducting classes in agriculture and the number is rapidly increasing. These schools are located in different parts of the province and represent 19 different counties. The attendance upon the classes is optional at present and the introduction of the courses into the schools is also optional, consequently the establishment of agriculture as a part of the high school course, will proceed only so fast as public opinion will permit. The number of students now receiving agricultural instruction in the high schools is about 800.

At the end of the second year of the course there is a departmental examination which may be counted as a bonus subject. In 1916 about 190 students took this examination. This work includes experimental laboratory work, relating to the fundamental principles of agriculture, and is made as practical as possible.

A course in the middle school is also provided and is arranged for two years, but where conditions are favourable and students are able to carry the work, it is possible to cover it in one year. There is, therefore, practically a four-year course in agriculture arranged for the high schools, and the equipment is paid

for by special grants distributed by the Education Department when the requirements are fulfilled.

A further provision is made for agricultural education by the establishment of a "department" in the high school under the management of an Advisory Council composed of men engaged in agricultural pursuits. Such schools as provide the accommodation to carry on the department, are intended to be the fore-runners of regular Agricultural High Schools. Quoting from the regulations we have this statement: "When the public interests necessitate Agricultural High Schools they will be duly established and liberally aided by the Government."

At present one high school has organized a department and two others are making arrangements to do so. It should be said here that liberal financial encouragement is given by the Education Department towards establishing and maintaining not only a department in agriculture but also, on a similar basis, a department in household science.

County agricultural schools have been established here and there in the United States, but they have not proved a success. They have become agricultural high schools. It was found that these schools could not secure the attendance because the courses did not lead anywhere

except back to the farm. An ambitious student upon entering an agricultural high school is encouraged by the fact that his course may lead to a profession if he wishes. After taking the course, however, he may go back to the farm but he is attracted by the fact that there are other doors open to him.

Minnesota has now 175 agricultural high schools and no county agricultural schools. Wisconsin had several county agricultural schools, but has now only one. In Michigan the county agricultural schools have not been a success and there is now only one left. These three states are pushing as fast as possible the agricultural high school, which is nothing more than a high school giving a good course in agriculture. We have now in Ontario 21 such schools and this number would be increased enormously if agriculture were recognized as an elective subject for

matriculation. In the three states mentioned agriculture has a standing similar to that of other studies and may be offered for matriculation. The chief reasons why it is not introduced more rapidly are because of an extreme difficulty in securing qualified teachers, and because the subject has the standing of only an option, not being recognized at all in matriculation and being only a bonus for the teachers' examination.

In conclusion it might be said that the influence of agricultural classes is already being felt, for, in several instances, boys passing the entrance are attracted to the high school for a year or two, knowing that they will receive some instruction on the principles of agriculture. In schools where such classes are not yet introduced, boys similarly situated stop school when they pass the entrance, for if they go back to the farm the high school has little to offer.

MANITOBA

BY H. W. WATSON, M.A., DIRECTOR ELEMENTARY AGRICULTURE, DEPARTMENT OF EDUCATION

THE agricultural high schools in Manitoba were established for the purpose of giving a distinct course in agricultural science, in addition to the general science course already being taught. Five schools, namely: Stonewall, Teulon, Holland, Roblin and Dauphin added such a course three years ago, and each engaged a graduate of an agricultural college as a member of the staff to teach the course as outlined.

The course is outlined for farm boys, some of whom may have left the public school from three to six years previously, and may never have gone beyond Grade VI while there. The course for such boys begins about November 1st, and continues until April 1st, when they return to work on the farm. It requires attendance during two win-

ters in order to be completed, and includes the subjects taken up during the first two years at the Agricultural College, namely: field husbandry, animal husbandry, dairy husbandry and kindred subjects.

During the first year those taking the agricultural course were almost entirely from the farms, and had been absent from school for some time, but the number of such in any district must necessarily become exhausted; hence some of the boys in the high school course have been induced to attend these classes in addition to their regular work.

During the past year two of these schools (Teulon and Roblin) have placed the agricultural course in the regular work of the grades throughout the entire school year. Grade VIII students will be taking some subjects, grade IX some,

grade X others, and grade XI the balance.

During the last week in March an examination is given the agricultural students, the papers being either set or revised by the staff of the Agricultural College. The answer papers are marked by the staff of the Agricultural College, and students are exempted from those subjects in which they are successful should they wish to attend the College later.

The number of students enrolled in these courses during the past three years ranges from about 50

during the first year to about 75 during the last year; this will naturally increase as the work is made available to the boys of the regular high school course.

The equipment for agricultural instruction includes shops and tools for farm carpentry and blacksmithing, apparatus for grain testing, soil testing, milk testing, experiments in physics and chemistry. The field work has included the laying out and beautifying of the school-grounds, and the planting of gardens and demonstration plots from one-half to two acres in extent.

SASKATCHEWAN

CREELMAN, S.D. No. 998

BY F. C. COUSINS, PRINCIPAL

ON page 763 of THE AGRICULTURAL GAZETTE for August, A. W. Cocks, B.Sc., Director of School Agriculture in Saskatchewan, briefly described the rural school at Creelman, Sask., under the caption of "A Rural School With Ten-Acre Grounds." The following is a detailed description of this school, including an outline of its history and progress:—

Creelman, S.D. No. 998, was organized early in the year 1904. A one-room frame school house was erected in the village of Creelman, and this building served the educational requirements of the district until August, 1915, when work on the construction of a modern two-room brick-veneered school was commenced. This building was completed towards the end of November, and following the formal opening ceremonies, on November 29th, both rooms were put into operation. The contract for the erection of the building was \$4,649, and inclusive of new equipment the trustee board have expended in the past few months in the neighbourhood of \$6,000.

THE SCHOOL GROUNDS

The new school grounds comprise an area of ten acres, high, dry, and well situated immediately adjacent to and on the east side of the village. In providing a school ground of this size the trustees realized that the agricultural phase of education should be made a prominent part in the curriculum of the rural and village school. The ten acres will be sub-divided into boys' and girls' playgrounds, areas for vegetable and flower plots, and afford also sufficient space for the carrying out of various ideas suggested through the rural education association of the district. A thousand trees and shrubs have been secured from the Forestry Farm at Indian Head and the Government House at Regina, and these together with hedges have already been planted. From the entrance to the grounds leading to the school a six-foot cinder walk has been laid down. It is the intention of the Board to put forward every effort in an endeavour to make these grounds a beauty spot and a central location in which the people of Creelman and surrounding district

will take pride, and which will serve to stimulate a broader interest in the school and its work.

THE SCHOOL BUILDING

The school is a brick-veneered two-room building. From the outside, it presents a neat appearance. The main entrance which is on the west side of the building leads into a hall eleven feet square. From this hall there are doors, opening into each class-room, to the cloak rooms and to the basements. There are two cloak rooms, one for each of the class-rooms. Each cloak-room is provided with a sink, pump, and sanitary towels, a cistern in the basement providing a good supply of soft water. Both class-rooms are large (32 by 24), airy, well-lighted and well heated and ventilated.

The class-rooms face the south, and in each room there are six large windows situated on the east-side of the building. These six windows with sills thirty inches from the floor, with a combined lighting area of approximately one hundred and fifty square feet, assure a good supply of light. The windows are equipped with tan-coloured automatic folding window shades. Both rooms are heated and ventilated by Waterman Waterbury heating and ventilating systems, and during the past season these proved satisfactory in all respects. Opening off each room is a small library containing a cupboard and bookcase. The interior furnishings of the rooms including

movable seats, wall pictures, piano, school-room equipment, etc., are quite up-to-date. A library table in the senior room is kept well supplied with current literature, including a good variety of agricultural journals. The last Friday of each month has been set aside as visitors' day at the school, and at these monthly meetings the school literary society provides a short programme.

Not the least interesting feature of the new building is to be found in the basements. In the girls' basement there is a large table, kitchen range, and cupboard, affording excellent facilities for providing a warm noon-day lunch for the pupils from the country. On the boys' side there is a manual training room. This room is being equipped and classes in manual training will be commenced as soon as possible. In both basements there are sanitary closets.

CREELMAN COMMUNITY MEETINGS

Following the opening of the new building the Creelman Community Club, with "Spizzerinktum" as its watchword, was organized. This organization held fortnightly meetings in the school building and did much towards interesting the people of the district in the work of the school. At each meeting a programme of a varied nature was provided, and, although the weather was on many occasions distinctly unfavourable, the gatherings were quite well attended.

BOYS' AND GIRLS' CONTESTS

ON page 268 of the issue of THE AGRICULTURAL GAZETTE for March, 1916, and on pages 462 to 465 in that for May, there were outlined and described a number of boys' and girls' contests being conducted under the auspices of the rural education associations of

the municipalities of Weyburn and Cymria. These associations were primarily organized by Mr. A. Kennedy, M.A., inspector of Schools for the Weyburn Inspectorate. The final awards in the contests in the raising and feeding of swine, beef cattle, sheep, poultry and in manual

training, were recently made by Prof. W. H. J. Tisdale of the Extension Department of the College of Agriculture, Saskatoon. The results of the contests were highly satisfactory and the work accomplished by some of the youthful competitors was indeed gratifying. A possible score of 300 points for three judgments during the season, and for record kept, was allowed in the swine, beef cattle and sheep contests, and for two judgments and record in the poultry contests. Many high scores were

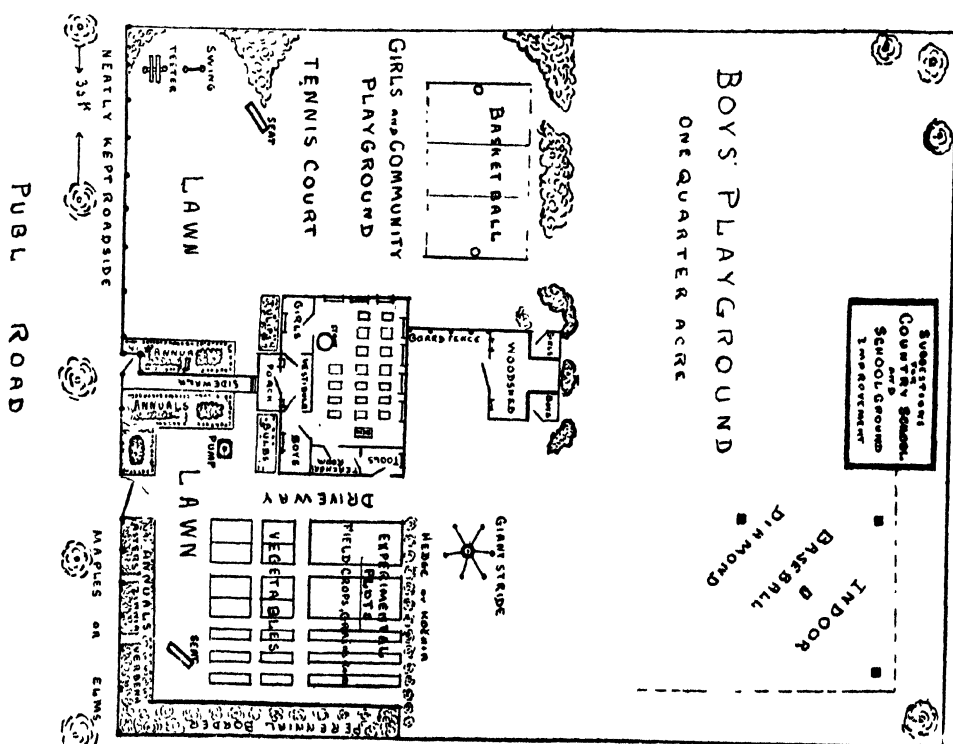
made in each contest. One of the best competitors succeeded in raising ten pigs to more than 200 pounds each within seven months, which he sold at eleven dollars per hundred-weight, kept a complete record of his work, finally winning a cheque for \$27 and a gold watch. Two household science contests were held, one at the Weyburn fair and one at the Midale fair. Out of a possible of 200 many of the girls competing made high scores, and good work was in evidence at both places.

SUGGESTIONS FOR RURAL SCHOOL IMPROVEMENTS

FROM SCHOOL CIRCULAR NO. 2, ISSUED BY THE DEPARTMENT OF EDUCATION, CHARLOTTETOWN, P.E.I.

THE diagram shown herewith represents a half acre of land, 8 rods wide and 10 rods long. About one-half is for the boys' play

ground. The school garden, including the flower borders, lawn and paths, comprises about one-sixteenth of an acre. Where the school is



SUGGESTIONS FOR THE IMPROVEMENT OF SCHOOL GROUNDS AND
DIAGRAM OF WEST ROYALTY SCHOOL

large, there should be at least an acre of ground provided.

The plan of the school house is that of the West Royalty school built in 1915, modified to provide a small room for storing tools. It shows an up-to-date lighting system as well as other good features. The school cost \$850.

The plan of the outbuildings suggests means of securing the separation and non-exposure of the closets. All schools should be provided with up-to-date sanitary closets separated and screened. The flower-growing part of the school garden is planned to make the school property a local "beauty spot". The plots for field crops and vegetables are experimental and demonstrational. All the garden plots should be made secure against chickens with chicken netting, if necessary.

The provision of playing facilities

for the community as well as for the pupils is suggested. One-quarter acre is ample area for baseball playing, with a so-called "indoor" baseball; and it is a splendid game for a country school, or a country community. A "giant-stride" for the boys can be made with a stout upright post, an old mower wheel and wire clothesline rope. Tennis and basket ball are suggested for the older girls, either pupils or ex-pupils. The little pupils might have a swing, a teeter and a sand pile.

The tree planting is planned as a roadside improvement. The road in front of the school should be kept neat and attractive. Trees and shrubbery planting should not be overdone; hedges and clumps of shrubbery should not shut in the school and its surroundings from view, but be part of a scheme to make the general view attractive.

BROADVIEW BOYS' FAIR

IN Part IV of THE AGRICULTURAL GAZETTE for January, 1916, page 89, is given some account of the Broadview Boys' fair, held annually in Toronto, and which claims to be the biggest fair of its kind on this continent. In the article referred to it is explained that what was formerly known as the Broadview Boys' Institute is now a branch of the Young Men's Christian Association on Broadview Avenue, Toronto. All the original activities are maintained and have been added to under the new organization. Chief among these is the "community" garden, a plot of land divided into lots supposed to be surrounded with city streets, that is governed, controlled and managed by a city council, with boys as aldermen and controllers, and a boy mayor. The garden is inspected and judged and awards made periodically by a committee of gentlemen nominated by the boys,

and at the end of the season a three-day fair is held. The dates this year were September 21, 22 and 23, and the fair proved, in point of exhibits and results generally, the greatest success yet achieved. There were no fewer than 1,600 entries in the 22 classes for which the prize list provided and 600 exhibitors, who shared, according to the merit of their showing, \$500 in specie and many special prizes. The exhibits, as related in THE GAZETTE article previously spoken of, comprised flowers, vegetables, ponies, dogs, rabbits, pigeons, poultry, natural history specimens, photographic samples, drawings, manual training achievements, aeronautic and naval models and domestic science results, while competitions were had in penmanship, oratory, music, spelling, flying models, scoutcraft, athletics and swimming.

PART IV

Special Contributions, Reports of Agricultural Organizations, Notes and Publications

FARM MANAGEMENT DEMONSTRATIONS IN THE UNITED STATES

ADDRESS DELIVERED BY E. A. BROWN, STATES RELATIONS SERVICE, UNITED STATES DEPARTMENT OF AGRICULTURE, AT THE CONFERENCE OF DISTRICT REPRESENTATIVES HELD IN TORONTO

FARM Management Demonstrations are demonstrations in the business of farming which emphasize better farm organization and business practices. They aim to teach the farmer to keep a record of his business, to summarize and analyze it, and then, by comparing it with the averages of the more efficient farmers of the community, to determine how he can strengthen that business to make a greater net income.

MAKING A HOBBY OF ONE BRANCH

A very large number of American farmers, and I presume it is true of Canadian farmers also, think of their farms in terms of a single crop or kind of live stock. They are proud of being fine wheat growers, hog breeders, or dairymen, and pride themselves on the excellent products they produce, regardless of the actual profits secured in doing so. Very few of them think of their farms as a whole, consisting of a number of crops and several kinds of live stock, which should be so combined as to make profitable use of the farm labour throughout the year, thus aiding in producing a satisfactory net income in return for the year's work. Some farmers even boast of the profit made in connection with some favourite enterprise, without seeming to realize that the whole farm is subordinated to that one enterprise, and that, while the income is good from the standpoint of that one enterprise, it is poor from the standpoint of an entire farm which has little other income. Again, these farmers are sometimes considered successful by their neighbours and others, simply because year after year they spend much of the interest from their investment on improvements which attract attention to the particular enterprise for which their farm has a reputation, but which does not

add much to the income secured from the enterprise. In many cases they delude themselves, as well as others, into believing that they are really successful. Therefore, it would seem that there is a great need to impress upon farmers the importance of thinking of their farms with regard to the net income from the whole farm, rather than from the standpoint of yields alone or the returns from any one enterprise. Furthermore they should be encouraged to make a thorough study of their own business as a means of making it more profitable.

DEMONSTRATION METHODS AND OBJECTS

Farm management demonstrations are a part of the general extension work conducted by the United States Department of Agriculture in co-operation with the agricultural colleges in the thirty-three Northern and Western states. In nearly every state there are one or more extension specialists known as farm management demonstrators, who are joint representatives of the state and Federal Government, and who spend their entire time in assisting county agents, teachers of agriculture in rural high schools, and other local leaders in conducting farm management demonstrations.

In launching a farm management demonstration in a community, the county agent and farm management demonstrator secure business analysis records from 50 to 100 farmers who are farming under similar agricultural conditions. These records consist of an itemized account of the farm receipts and expenses, together with the capital invested in the farm, live stock and equipment. The records are summarized to determine which of the farms are the more successful and then analyzed to determine why some farmers are

securing a greater income than others. This summary and analysis is returned to each farmer, showing how his farm business compares with the average of the more successful farms of the community. If the farmer desires, the agent undertakes to assist him in determining upon changes which promise to make the farm more profitable, at the same time urging him to keep a more accurate record of his business next year and showing him how to keep this record, usually in a specially prepared account book which the agent either gives to the farmer or furnishes him at cost. Then, at the end of the year, those farmers who have kept a record in this manner are assisted in summarizing their records to see how profitable their business has been, and, in analyzing them, to see why they did not make greater incomes.

LABOUR INCOME THE BEST

So far, the best means of comparing the efficiency of one farm with another is by means of the labour income, or the amount each operator receives for his year's work. This is found by subtracting from the total farm receipts the farm expenses and 5 per cent interest on the capital invested in the farm business. In addition the farmer has his home rent free, and such produce as milk, eggs, vegetables, etc., which are furnished by the farm.

In every community in which a demonstration has been launched (and up to August 1st. analyses of the farm business had been made for 14,331 farmers in 183 communities), there have been found some highly successful farmers who are making from \$800 to \$2,000 more than the average. In other words, at the present time these farms are so well organized that they are returning a good labour income.

This chart shows the variation in the labor income in a few areas:

AVERAGE LABOUR INCOME OF SOME AMERICAN FARMERS IN WIDELY DISTRIBUTED AREAS

Number of Area.	Number of Area.	Average Labour Income of					
		All farms in Area.	First Best Fifth.	Second Best Fifth.	Third Best Fifth.	Fourth Best Fifth.	Poor-est Fifth.
1	68	\$ 391	\$1766	\$ 552	\$ 291	\$ 4	\$ 834
2	70	212	1095	399	171	33	569
3	65	1417	3329	1953	1202	775	173
4	67	94	1041	220	40	318	1112
5	49	205	734	129	83	606	1313
6	69	240	1021	409	142	42	375
7	65	460	1406	730	431	212	472
8	62	200	1002	430	174	25	470
9	59	136	816	193	79	72	381
10	68	202	1183	566	142	262	758
11	73	293	1333	560	279	51	805
12	61	493	1926	756	468	206	850
13	100	48	1032	142	128	326	960
14	70	1598	3194	1934	1552	994	314
15	75	195	1675	413	97	246	963
16	225	480	1684	825	389	28	526
17	70	215	998	349	164	19	418
18	23	142	949	315	75	104	675
19	61	282	965	418	320	76	224
20	89	42	662	208	26	184	532

In the above table the word fifth is used to designate one-fifth of the total number of farmers in the demonstration area. For instance, in Area No. 1, which contained 68 farms, one-fifth of the 68 farmers made an average labour income of \$1766. These were "the best fifth." Another fifth or the "second best fifth" of the 68 farmers made an average labour income of \$552. Likewise the other three fifths of the 68

farmers are shown as the "third best fifth", the "fourth best fifth", and the "poorest fifth."

A WIDE VARIATION

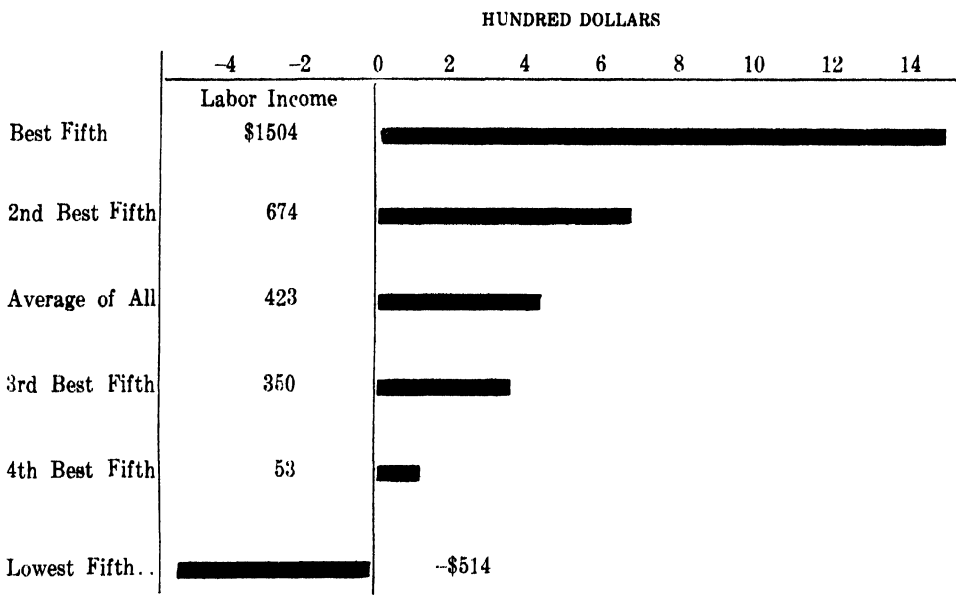
You will note that in the first area, while the best fifth of the farmers made an average labour income of \$1766, the poorest fifth lacked \$834 of paying interest on their investment and received nothing for

their wages. This is a difference of over \$2500 between the two groups of farmers. In the second area this difference is about \$1500 and, in the third, about \$2000. By going over the figures for each area it will readily be seen that this same wide variation exists. The best fifth of the farmers in every community invariably secure a

satisfactory income, while, on the other hand, the poorest fifth almost invariably fail to make 5 per cent interest on their investment, let alone having any pay for their year's labour.

Possibly another chart will illustrate this point more forcibly.:

AVERAGE LABOUR INCOME IN 106 AREAS IN 22 STATES



This chart was made up from figures for 7432 farms in 106 areas in 22 States. It will be seen that the better farmers were, on the average, making about \$1500, or over a thousand dollars more than the average of all, while the poorest group were making about \$500 minus, or nearly a thousand dollars less than the average of all. Farmers in this last group received nothing for their time and actually paid for the privilege of working their farms.

After summarizing the business of a group of farmers and finding such difference between them as is illustrated by these charts, it is comparatively easy to analyze the business of each farmer and point out to him in terms he can understand such

as crop yields, acres of crops, number of animals and receipts per animal, just how his business compares with that of some of his neighbours, who are perhaps making a thousand dollars more.

ANALYZATION OF CORN-BELT FARMS

The chart on the opposite page gives the analysis of the business of two Corn-Belt farms and compares them with averages of other farms located in the same neighbourhood. In column III is shown the average for all 62 farms in the area. In column II, 13 of the better farms are averaged. Column I shows one of the more successful farms that of Mr. A. Mr. B's farm, shown in column IV, is not as good as the average of the 62.

COMPARISON OF SOME CORN-BELT FARMS

	I Mr. A'S farm	II Average 13 better farms	III Average 62 farms	IV Mr. B'S farm
Labour Income	\$1,231	\$1,050	\$ 145	\$ 72
Size of Business:				
Total Acres	282	188	171	100
Crop Acres	234	144	125	70
Animal units	18	24	21	12
Total receipts	\$3,393	\$3,211	\$2 430	\$1,597
Quality of business:				
Live Stock: returns on \$100 worth feed	\$102	\$130	\$119	\$169
Crop Yields:				
Corn, bushels	50	43	38	40
Oats, bushels	37	40	37	37
Hay, tons	1 3	1 6	1 6	1
Efficiency of labour:				
Crops acres per man	102	85	75	59
Crops acres per horse	37	22	18	12
Diversity of business:				
Main sources of income—				
Corn	\$680	\$813	\$615	\$360
Oats	584	304	240	
Hogs	843	868	685	680
Cattle	556	536	359	355

WHAT COMPARISONS SHOW

It will be noted that, considering the importance of the corn crop in that section, Mr. B's crop yields were about as good as the average of the community shown in column III, and that his live stock were very much better even than the live stock of the better farms averaged in column II. What, then, is the reason that his labour income is but half the average of the neighbourhood and about one-fifteenth the average of 13 of the more successful farms? His trouble is due almost entirely to having too small a business. His crop acres per horse in comparison with his neighbours show that he could care for about twice as many acres of crops without any increase in his work stock; likewise his men are not working to good advantage. If he had a larger acreage he might also increase his live stock operations, to which enterprise he seems so well adapted, or he might put in some cash crops; in fact, it would be wise for him to do both. The oat crop may not be so very profitable per acre in that section, but the way it is grown there fits in with the corn crop fairly well and enables a farmer to use both men and horses when otherwise they might not be engaged in any very productive labour. If Mr. B. had some cash crops it would not go so hard with him in case he had bad luck with his feeding operations, such as an outbreak of hog cholera which might wipe out a large part of his income from that source. If Mr. B cannot secure more land he should dispose of some of his horses and save the expense of feeding and caring for them.

SUCCESSFUL MR. A.

Mr. A, whose farm is shown in column I, owned fewer acres than did Mr. B, but he rented land enough to make his crop area double that of his neighbours and more than treble that of Mr. B. In spite of this fact he grew good crops, better than the average, almost as good as the best, and yet he had but little more work stock than had Mr. B. The larger area enabled him to grow more oats, almost double that of the more successful farmers. His income from this source alone was more than eight times Mr. B's entire labour income. His income from cash crops was almost as great as that from live stock—a very wise diversity to have, as evidenced by the 13 more successful farms shown in column II. In looking over these figures, however, it was evident to Mr. A that he could increase his income still further by better handling of feeding stock.

In this area there were 29 farms from which the labour incomes were smaller than the \$72 which Mr. B. secured from his farm; in fact, most of the 29 failed to pay 5 per cent interest on the investment. If weaknesses in the farm organization can be pointed out so readily to Mr. B, and even in a small way to Mr. A, it is evident that the operators of many of the 29 farms may receive material assistance when their farms are compared in a similar manner. Indeed, weaknesses may be pointed out in practically every farm in the area by means of such a comparison as the foregoing.

AN APT ILLUSTRATION

In discussing the farm business with a farmer, his farm is often likened to a "four-horse" team, in which the number of acres, yield per acre, number of animals, and yield per animal are the "four horses" pulling together on the successful farms. If the farm is weak in one of these respects, thus causing one "horse" to slow up, the team is weakened accordingly and the farm is less successful. It is the efficient, well-balanced farm of good size, with satisfactory crop yields and good producing stock, and with sufficient work to give profitable employment to men, horses, and equipment throughout the year that has the best chances of returning its operator a good labour income year after year.

HELPFUL TO COUNTY AGENTS

The benefit of the farm management demonstration work to county agents is very pronounced. Everywhere throughout the United States these agents speak of it in the highest terms. It enables them to get a better grasp of the problems in their counties than they could get in any other way. At the same time the agents are rendering a truly appreciated service when they can point out to a farmer wherein his business is failing and how he can adjust it to make more money.

Possibly you would be interested to hear what one or two agents have said about this work. One agent in Colorado has this to say:

"I do not know how much the farmers will profit by this work, but this method of studying farms has been of value to me. I can now plainly see that suggestions for the improvement of methods of any particular farm would likely be failures and might be positively harmful unless based on a careful analysis such as the records afford. To advise without this detailed examination would be like a doctor prescribing for a patient without a careful diagnosis."

Another agent in the State of Maine, after having returned the summaries and analysis to the farmers, says:

"Practically all the farmers were glad to talk over their records; many had many questions to ask; some had figured out from the comparison sheet which had been sent them in advance

just about what was wrong with their business; some had already planned changes; and others were willing to change when they were shown the reasons for so doing. One farmer stated he believed this work would have a great influence for the good of the community. He also said he had been talking to some of the other farmers, and they had decided that if about 100 farmers could go together they could easily afford to pay a man \$2,000 and expenses to do nothing but help them organize their farms."

I will not burden you with more of these statements, but will merely add that, almost without exception, the county agents of the United States consider this phase of their work to be one of the most important projects.

WORK FOR THE YOUNG PEOPLE

Farm analysis work is not only being carried on with farmers, but it is also being taken up with the older boys in the rural schools. When a boy makes an analysis of the business of his father's farm, and points out to his father that the cows are not doing as well as those of their more successful neighbours, and that they apparently have more horses than is necessary, it usually opens the father's eyes and sets him to thinking. You can readily see that there is a wonderful opportunity to work with these younger people, especially in assisting them to keep farm accounts, not cost accounts, but merely simple records, on their father's farm. I believe we all feel that our greatest results in any kind of extension work will be secured through the younger people on the farms.

RAPID DEVELOPMENT

In conclusion I would say that although the farm management demonstration work in the United States was only inaugurated two years ago, it has developed with remarkable rapidity. On October 1st, 1914, the work had been launched in six states and records secured from 557 farmers in eight areas. A year later the work had been extended to twenty-two states and the farm business analyzed for 10,098 farms, while at the first of this month, August 1st, 1916, demonstrations were being conducted in 26 states with 14,331 farmers located in 183 different communities.

THE AGRICULTURAL DEVELOPMENT OF JAPAN

EDITED AND COMPILED BY WM. B. VARLEY

THE Japanese Empire covers an area of 257,673 square miles. Of this, the main island comprises one-third, Korea (annexed in 1910) one-third, the remainder being made up of adjacent islands, including Hokkaido, Formosa (ceded by China in 1895), Saghalien (ceded by Russia in 1905), etc. The coast line, with its numerous indentations, exceeds in ratio to area even that of such countries as Greece and Norway, countries that are particularly remarkable in this respect.

Being situated for the most part in the temperate zone, the climate is mild and salubrious, while the rainfall is abundant.

Japan is amply provided with natural wealth. The abundance and diversity of the fish found in her seas are unequalled in any other part of the world. On land, the forests are exuberant, and embrace nearly all species from the torrid to the frigid zone. Rich deposits of coal, copper and petroleum are widely distributed throughout the country.

THE POPULATION

The population, already somewhat crowded, shows a marked and steady increase. For Japan proper the total number of inhabitants is between 52 and 53 millions, and the rate of annual increase, per thousand, from twelve to thirteen per cent. Of the above, the urban population is about 13 millions, the remaining 39 millions residing in rural districts. Including the new dominions, the population exceeds 60 million souls. In density of population, Japan proper stands next to England among European countries, being 350 per square mile as compared with 367 for the United Kingdom. In Korea the rate is 116, in Formosa 233, while in Saghalien it is only 2, making the average of the Empire 251 per square mile.

Nearly sixty per cent of the entire population belongs to the farming class, so that agriculture may still be regarded as the dominant industry. In view of the present tendency of the urban population to increase more quickly than the rural communities, and of the very rapid development that is taking place in commerce and manufactures, the question of how long agriculture will predominate is a matter for interesting speculation.

AGRICULTURE AND OTHER INDUSTRIES

The hilly nature of the country, and the comparatively small area of level, arable land is the chief drawback to agriculture. The land is, however, utilized to the utmost extent, even to the mountain slopes. As

carried on in Japan, agriculture is essentially tillage, has little to do with stock farming, and is on so small a scale as to resemble gardening rather than farming. The average extent of farm land per family does not exceed two and a half acres. The practice of raising two crops in the same year is more or less general, so that the land is farmed to the extreme limit of its productive power. At the same time, specialized industries, closely related to agriculture, greatly assist in the maintenance of the population. Among the chief of these are silk culture, tea manufacture, straw-braiding and floor matting.

The industry of plaiting straw and wood shaving has spread throughout the country as a subsidiary occupation, and, as it is based on the utilization of waste products, it is considered to be a very profitable one. The output is exported to Great Britain, the United States, Germany and France, in that order, and the export figure in 1910 was twenty-five times as large as in 1887.

THE PRODUCTS

Among agricultural products, rice comes first in the order of importance, followed, at a distance, by barley and wheat, silk cocoons, beans, sweet potatoes, millets, tea, rape, tobacco, etc. Crops such as cotton and sugar-cane, which are rather exotic, show a tendency to decrease, but their place is being taken by the extension of mulberry orchards, and such occupations as fruit culture, kitchen gardening, dairy farming, all of which are making striking progress.

Horticulture, apart from the culture of plants and flowers, was comparatively neglected in Japan until quite recent times, but a growing demand for fruits and vegetables, improved communication and the introduction of new varieties from abroad have all contributed to its rapid development.

PRINCIPAL ARTICLES OF FOOD

Rice, the principal article of food, and the basis of the national beverage, *Sake*, is grown both on wet and upland fields. In the former, two crops are often raised each year. Barley and wheat often follow wheat on the upland farm as a second crop. Barley, wheat, millet, sorghum and buckwheat are regarded by the Japanese as foods subsidiary to rice. Wheat is largely used for making macaroni, and in the brewing of *Soy*, a liquid essential to native cookery. A large quantity of wheat is imported from North America. With the establishment of flour mills, since the

tariff revision of 1906, the relative figures of import of flour and wheat have been startlingly reversed. The other grains mentioned are usually boiled with rice for human consumption. Buckwheat frequently utilizes the land between winter and summer crops, and the macaroni made from it is a popular article of diet. Beans, soja and red, are also used as food and for feeding live stock. Three articles of diet, of which all classes regularly partake, are prepared chiefly from the soja bean—*tofu* (bean curd) a cheap, popular and highly nutritious food, *miso*, the basis of Japanese soup, and *soy*—already referred to.

The tea industry in Japan is for the most part a subsidiary occupation of farmers. The United States and Canada take the bulk of the tea exported. About 60 or 65 percent is exported and the balance consumed at home. To meet the powerful rivalry of India and Ceylon, improvement is sought in the article and the methods of handling, and the status of the industry has shown slight variation in recent years.

FARM INDUSTRIES

Sericulture, or silk production, is the leading secondary farm industry. Japan supplies about 38 per cent of the world's consumption, and silk stands first as an article of export. The industry is an exceedingly ancient one, being traceable even into the mists of the mythological ages. About 1360 years ago silk-worm eggs of the Chinese species were introduced and Chinese methods of culture adopted, since which time, although passing through

many vicissitudes, the industry has maintained a continuous existence, and further rapid expansion is looked for.

Cattle-rearing in Japan used to be chiefly for the purpose of tillage or draught work, and it is only recently that rearing for milk and meat was commenced. Such being the case, the business of dairy-farming and meat-preserving is naturally in an embryo condition. In 1911, there were 55,471 milch cows, the product being used almost entirely as fresh milk. The bulk of the butter and fresh meat consumed is imported. The poultry raising is of no great importance, though most farmers keep fowls more or less. The importation of large quantities of cheaper Chinese eggs seriously affects the prosperity of the industry.

ENCOURAGEMENT OF AGRICULTURE

The means adopted for the encouragement and protection of agriculture in Japan are quite in accord with those of western countries, comprising, as they do, institutions for educational purposes, for scientific investigations, demonstration farms, arrangements for the supply of capital, etc. Various institutions and associations have been organized by the farmers themselves for mutual protection and the development of their industry. To these means may be attributed much of the present prosperity of Japanese agriculture.

(Compiled from "The Recent Economic Development of Japan", issued by the Bank of Japan, 1915.)

RURAL SCHOOL FAIRS IN ONTARIO

THE history and development of the rural school fair throughout Canada, and, especially in Ontario, the pioneer province, reads like a romance; its success has been unique. The year of organization by the Ontario Department of Agriculture, and promotion generally, by the District Representatives, 1912, saw 25 fairs held in 12 counties; in 1913 there were held 69 fairs in 31 counties, including the childrens of 531 schools, who made 18,653 entries; still greater progress was shown in 1914, when 148 fairs were held in 37 counties, taking in the childrens of 1,391 schools and entries totalling 75,602, while in 1915 there were 234 school fairs held in 41 counties or districts, including 2,291 schools representing 48,836 children, and, while complete reports are not available for 1916, it is safe to predict, even in this adverse season, militating, as it did, against quality as well as quantity, in exhibits, that new records will have been made and greater success achieved.

The method of operation and the detailed story of progress have been printed in the March issue of THE AGRICULTURAL GAZETTE, Volume 1, No. 3, page 175, in the January issue, Volume 2, No. 1, page 54, and in that for January, 1916, Volume 3. In a future issue the record for 1916 will appear, consequently, it is hardly within the scope of this article to deal with the subject in detailed form. It is rather the intention of the writer to record impressions gained from visiting a number of school fairs, and to describe briefly, a few features which are helping along this great movement.

The basis of organization is the township, district, or a group of schools convergent to a central point. Each district so chosen constitutes a Rural School Fair Association, whose president, vice-president, secretary and board of directors are elected by the pupils of the schools from among their numbers. These officers are directly responsible for the organization and details connected with their fair, always, of course,

guided and advised by the District Representative, who acts in the role of a general manager. Thus, into the minds of the pupils are instilled the basic principles of organization and election, and they are self-taught, as it were, to use their minds and develop themselves into thoughtful and useful citizens.

The visitor to a school fair, no matter how casual he may be, cannot fail to be impressed with the spirit of enthusiasm, interest and fair play which permeates the whole body of children participants, and especially is this true of the youthful officers. The part taken by these officers is made evident in many ways, but in none more clearly than was demonstrated at a school fair held by an association in Lanark county, whose president was a 15-year old girl. A feature of the programme at this fair, as at many others, was the boys' and girls' public speaking contest, in which each of the competitors was allowed from three to five minutes to deliver an address on a subject of their own choice. Calling the people together for this event, the District Representative introduced the girl president, who at once assumed charge, delivered a brief, but eloquent presidential speech and then introduced the competitors in turn, finally inviting one or two from the outside to address the audience. Her handling of a difficult task was exceedingly capable and was evidence of the great and lasting good of the rural school fair movement.

JUNIOR FARMERS' IMPROVEMENT ASSOCIATIONS

As a result of the short courses in agriculture conducted by the District Representatives there have been organized, in many Ontario counties, Junior Farmers' Improvement Associations, the membership of which consists of young men who have been members of the short course classes. That this organization will become an important factor in the moulding of the agriculture of the province is clearly evidenced by its many activities. Whenever organized the associations prove a great help to the District Representatives, assuming as they do the responsibility for much detail work in connection with school fairs, as the following incident will show: the District Representative in Durham county decided to conduct stock judging competitions at the Blackstock school fair, and informed the secretary of the association of his decision, making the request that the details should receive attention. The secretary then called an association meeting, at which committees were appointed to secure, and return, the necessary stock for the competition and the members took it upon

themselves to make the event a success. Seven teams, of three boys each, representing seven schools, were entered. Each team received considerable training and coaching in preparation for the competition from a member of the Junior Farmers, and the work accomplished by the various teams proved the quality of their training. The Junior Farmers have also rendered valuable assistance in securing school fair sites, in erecting tents, in the preparation of buildings and sheds, in conducting competitions, in the supervision of the games and sports, and in some cases have judged the live stock entered for competition by the boys and girls.

THE EXHIBITS

The crops grown by the children during the year form the basis of exhibits. In general, the exhibits include oats, barley, wheat, corn, potatoes, mangels, turnips, carrots, beets, all of which are the product of special seed distributed by the Department. An added feature to the prize lists of fairs held in Renfrew county worthy of special mention, especially under present conditions, was the awards offered for home-grown root seed which brought out some excellent seed. It has been proven that home-grown root seed has many advantages over the ordinary commercial seed, so that this effort is one deserving of every encouragement.

Great improvement is noted in the quality and uniformity of exhibits, but it would seem advisable that after a class is judged sufficient time should be at the disposal of the judge to state his reasons, in simple language, for placing his awards, for many a prize is lost by the inclusion of a potato, which is off-type, large and coarse, or a bruised, scabby, or otherwise defective apple, etc. An explanation would leave in the mind of the youthful exhibitor an ideal to strive for.

At a number of the fairs held in Carleton county a silver cup is presented to the school scoring the highest on exhibits, the score being calculated on a percentage basis. This induces greater united effort on the part of all the competitors from individual schools.

Much might be written regarding the social influence wielded by the school fair in a community. To many a boy and girl it is the day of days, a day of triumph, a day of achievement. It provides a real outing for old and young alike, and it should not be a far step to the time when the children's association should prove to be the hub in a well-organized "community centre movement."

BOYS' AND GIRLS' CLUBS IN THE UNITED STATES

THE development through the United States of the juvenile agricultural club work has been rapid.

Agricultural clubs for boys and girls were first organized in the Southern states in 1907, and in the Northern and Western states in 1912. The enrolment in the south, at the time the last year contests were held, included approximately 63,000 boys and 42,000 girls. In the Northern and Western states the total enrolment is given by the "Weekly News Letter" as 209,178 boys and girls.

In the south, among the boys, corn clubs predominate. Pig clubs are next in popularity and are organized in all the Southern states. After the boy has learned the fundamental principle of growing corn in one of these clubs he is urged to grow three crops on two acres.

On one acre corn is grown, on the second acre oats or other small grains followed by cowpeas. Baby-beef clubs, cotton clubs, and potato clubs also operate in the Southern states. Four-crop clubs are also organized.

In the Northern and Western states boys' clubs are devoted to the production of corn, potatoes, grain-sorghums and miscellaneous field crops, also to the raising of poultry, pigs and sheep. Girls' clubs in the South are devoted chiefly to the canning of fruit and vegetables, while in the Northern states these clubs carry out such projects as gardening, canning, sewing, cooking, home economics and bread-making. The variety of projects is made necessary to meet the climatic, soil and cropping conditions of the various sections served.

SCHOOL GARDEN AT OTTAWA

THE Public School Board in the city of Ottawa has made a beginning in school garden work. The School Board last spring secured the use of three lots each 50 x 100 feet in what are known as the Glebe lands of the St. Andrew's Presbyterian church. The lots had been gardened last year in the vacant lot gardening scheme referred to in the June and December numbers of THE AGRICULTURAL GAZETTE. The work was under the direct supervision of Dr. Putman, Senior Inspector of Schools, who received valuable assistance from Mr. Newlands and Mr. Medcalf, supervisors of art and manual training respectively. The pupils,

some three hundred and seventy in number, were selected from grades 3, 4, 5 and 6 of two of the schools. The land was divided into small and large plots. Small plots each 3 x 4 feet were planted with vegetables and flowers and allotted to individual pupils, while the larger plots were devoted to flowers and grains and managed collectively by the pupils. The flowers were donated to the city hospitals.

The School Board has allowed one of the teachers to take a special course in horticulture at the Ontario Agricultural College with a view to extending the work on a more thorough scale.

VOCATIONAL EDUCATION IN THE UNITED STATES

AT the second annual convention of the Vocational Education Association of the middle west held in Chicago, among the subjects taken up was that of better agriculture. During a discussion of this subject, Dean Davenport of the Iowa Agricultural College asked the question: "What do we have in mind when we talk about a better agriculture?" Then he answered his own question: "It means business or it means nothing." There are four central thoughts around which these ideas about better agriculture cluster—four that we ought to keep in mind.

First—More profitable farming. Farms must pay better than ever before. The man who owns a farm now did not pay for it; its value is an "unearned increment" due to the rise in land value. I do not believe that farms have ever yet earned enough to pay for the labour the farmer has put on the land and the fertility he has taken off!

"Tom owns a farm he inherited. His father was a poor farmer; he is a poor farmer. He can't make any money at farming, but he can sell his land at \$200 an acre or he can mortgage it at from \$75 to \$100 an acre and buy automobiles, go to

Europe, etc. But this is no credit to Tom or his farming."

Second—We must make farming permanent. We must treat this land so that it will be handed on to our children in just as good condition as it is to-day. In some places it is already too late to do this, because you can't raise on the land \$2 an acre, the amount necessary to purchase the lime to restore the soil.

Third—One-third of the people live on the land. If they are to be competent farmers they must be comfortable or you

will have an American peasantry instead of an American citizenship. The farmer and the farmer's wife must have the comforts and conveniences of modern country life.

Fourth—The farmer must realize something of the beauty in the open country. He must add the beauty element to his farming. He must do planting about the place, along the roadside, along the railroad—just for the sake of beauty. It takes thought, but it gives joy, and makes the farm more than a place to labour and to eat.

SOCIETIES AND ASSOCIATIONS

The Eastern Ontario Winter Fair will be held at Ottawa from January 16th to 20th, 1917. Secretary, W. D. Jackson, B.S.A., Carp, Ont.

The annual convention of the Apiculture Society of the province of Quebec, will be held in Montreal, on November 15th and 16th; Secretary, A. O. Carniré, Abenakis Springs, Que.

The annual meeting of the New Brunswick Agricultural Societies united will be held on November 23rd, 1916, at St. John; Secretary, Stanley Wilson, Woodstock, N.B.

The seventh annual Toronto Fat Stock Show will be held at the Union Stock Yards, December 8th and 9th, 1916; Secretary, C. F. Topping, Union Stock Yards, Toronto.

The annual meeting of the Ontario Vegetable Growers' Association will be held in Toronto on November 21st; Secretary, J. Lockie Wilson, Department of Agriculture, Toronto.

The annual meeting of the Ontario Horticultural Association will be held in Toronto on the 22nd and 23rd of November; Secretary, J. Lockie Wilson, Department of Agriculture, Toronto.

The annual meeting of the Pomological and Fruit Growing Society of the province of Quebec will be held at Macdonald College on December 5th and 6th, 1916; Secretary, Peter Reid, Chateauguay Basin, Que.

The 50th annual convention and winter dairy exhibition of the Dairymen's Association of Western Ontario will be held in the city of Woodstock on January 10th and 11th, 1917; Secretary, Frank Herne, London, Ont.

The annual meeting of the Ontario Beekeepers' Association will be held in Toronto, on December 12th, 13th and 14th. Among the speakers will be Mr. C. P. Dadant, Editor of the *American Bee Journal*, Mr. F. W. L. Sladen, Dominion Apiarist, Mr. Deadman, Mr. Bisbee and Mr. Chrysler; Secretary Morley Pettit, Esq., O.A.C., Guelph, Ont.

Owing to the fact that the Militia Department is occupying the Maritime Winter Fair Building at Amherst, the winter fair will not be held. In its place there is being held a Maritime Poultry Show at Moncton from the 12th to the 15th, December, 1916; Secretary, J. P. Landry, Truro, N.S.

The annual meeting of the Nova Scotia Farmers' Association will be held in Amherst, Nova Scotia, on January 23rd, 24th and 25th, 1917. Co-operation, the sheep industry, good roads, buying feeds and fertilizers, freight rates, protection of the pure-bred sire, county associations, etc., are the subjects to be discussed; Secretary, C. R. B. Bryan, Truro, N.S.

The 53rd annual meeting of the Entomological Society of Ontario will be held at the Ontario Agricultural College on November 2nd and 3rd, 1916. A feature of the meeting will be a popular evening lecture by Dr. L. O. Howard, Chief of the United States Bureau of Entomology, Washington, D.C.; Secretary, A. W. Baker, O.A.C., Guelph, Ont.

THE CANADIAN SOCIETY FOR THE PROTECTION OF BIRDS

THE Canadian Society for the Protection of Birds has issued for exposure in public places in Ontario, a hanger bearing the heading "Protect the Birds and they protect you." This hanger bears the following information:

"We depend for our life on trees and plants.
Insects if unchecked increase enormously.
One pair of potato bugs if unchecked would increase to 60,000,000 bugs in one season.
One pair of Gypsy Moths if unchecked would produce enough moths to destroy everything green in Canada in 8 years.
Every year Canada loses \$180,000,000 in forests and crops through insect pests.
A bird will eat its own weight in insects in one day.
The crop of one bobwhite killed by a mowing

machine contained 40 potato bugs and 250 weed seeds.
Robins eat wire worms, click beetles, white grubs, cut worms, army worms, gypsy moths, brown-tailed moths.
Quails feed on weed seeds and potato bugs, and are the farmers' friends."

There is also issued as a separate hanger a "WARNING" which reads as follows:

Persons destroying or capturing wild birds or interfering with their nests are subject to a fine of \$20 under The Ontario Act to Protect Insectivorous and Other Birds.

Notice is given that members of the Canadian Society for the Protection of Birds will lay information against any person violating this law."

H. M. Merrill, President.

AN AGRICULTURAL CREDIT SOCIETY

A Farmers' Agricultural Credit Society has recently been organized at Wahstao, Alberta. The function of this new society, which has forty charter members, is described as a "financial self help." Loans will be granted and negotiated for members solely for the purpose of live stock. The method of operation is as follows: A member wishes to buy horses, cattle, sheep or swine; he gives to the committee a note for the purchase price, and the committee, in its turn, signs a note which is guaranteed by all the members on their mutual responsibility.

The debtor has the right to buy only the class of stock for which his note is given -- that is, if the note is for horses, he must buy horses, but he can also arrange credit for cattle, sheep, pigs and poultry.

If a member buys horses in this way, he is obliged the first three years to break not less than 20 acres of land each year; otherwise, the rules state, "the committee has the right, without judicial trial, to appropriate the horses, and the debtor has to pay the difference between the price at

which they were purchased and their value at the time they are taken away, together with expenses."

Each member must pay to the committee two per cent interest on the money he receives, in addition to the interest to the bank or loan company. No note of credit must exceed three hundred dollars.

MANAGED BY COMMITTEE

The association is managed by a committee, which consists of director, vice-director, and two members, elected by the majority of the association for three years.

In addition to granting loans the association will also arrange for the purchase of machinery direct from the manufacturers and thus effect a considerable saving. This machinery must be paid for in cash, with an addition of five per cent to the committee.

Among its other duties the committee has to inspect periodically the farms and stock of those members who secure loans, to ascertain if the conditions of the loans are being complied with.

SALES OF PURE-BRED LIVE STOCK

QUEBEC

BY J. A. COUTURE, SECRETARY, GENERAL STOCK BREEDERS' ASSOCIATION

THE General Stock Breeders' Association of the province of Quebec held its seventh annual public sale of purebred stock on the 11th of October, Montreal, and on the 18th of October at Quebec.

The sale comprised 306 animals, namely, 107 cattle, mostly all under 12 months old, 119 sheep and 80 swine.

At Montreal:

There were sold at Montreal 48 cattle, 70 sheep and 42 swine as follows:—

34 Ayrshires which sold for an average of	\$68 62
8 French Canadian cattle " "	61 25
9 Holsteins " "	98 50
Average for 48 cattle	\$76.12

14 Leicester sheep which sold for an average of	\$22 00
13 Cotswolds " "	35 23
4 Lincolns " "	24 00
2 Cheviots " "	13 50
20 Oxfords " "	30 04
9 Hampshires " "	40 02
8 Shropshires " "	24 63
Average for 70 sheep	\$27.06

19 Yorkshire swine sold for an average of	37 30
17 Chester-Whites " "	34.70
3 Berkshires " "	35.66
3 Tamworths " "	35 00
Average for 42 pigs	\$35 88

At Quebec:

There were sold at Quebec 56 cattle, 49 sheep and 38 swine as follows:—

39 Ayrshires sold for an average of	\$74 60
11 French-Canadian cattle	63 82
6 Holsteins	76 86
Average for 56 cattle	\$71 70
34 Leicester sheep sold for an average of	\$38 32
2 Cotswolds	26 50
3 Lincolns	21 66
2 Cheviots	16 25
4 Oxfords	43 00
4 Shropshires	33 00
Average for 49 sheep	29 80
23 Yorkshire swine sold for an average of	46 48
8 Chester-Whites	51 22
5 Berkshires	40 50
2 Tamworths	55 00
Average for 38 swine	48 42

The 306 animals were purchased by 86 Farmer's Clubs, 5 Agricultural societies and 40 private individuals. Hitherto only very young stock was offered for sale, but next year the Association intends to offer for sale the following cattle at each place, 20 two-year olds, 20 yearlings and 20 under 12 months.

ONTARIO**SALE OF LIVE STOCK AT THE AGRICULTURAL COLLEGE**

LIVE stock comprising 3 shorthorn bulls and 5 shorthorn cows (beef), 3 dairy shorthorn (1 yg. bull and 2 females), 4 Holstein bulls, 11 Holstein females, 3 Ayrshire bulls, 3 dairy grades (1 Holstein and 2 Jersey), 31 Yorkshire swine, 5 Berkshire swine, 2 Oxford shearing ewes, 4 Southdown shearing ewes, 3 Leicester ram lambs and 4 Shropshire ram lambs, were sold by auction at the Ontario Agricultural College, Guelph, on Tuesday, October 26th, 1916. The average for the shorthorn bulls was \$343.33, the highest price paid being \$450. The average for the shorthorn cows was \$369, and the highest price \$600, paid for College Augusta with calf. For Augusta O.A.C. 3rd, \$460 was paid. For 4 Holstein bulls \$750, was paid, average \$187.50, and highest price \$490 for Bonstje Lad, bought for the new school of agriculture at Kemptville. Eleven Holstein females brought \$1,475, average \$134, and highest price \$245, for Toitilla Rue, bought for the school of agriculture, Kemptville. The dairy grades brought \$265.50, average \$88.50 and highest price \$150. for the Holstein. Besides the Holstein bull, Bonstje Lad, 7 Holstein females and 1 Ayrshire bull were bought for the agricultural school at Kemptville. Thirty-one Yorkshire swine brought \$975.50, an average of \$31.46, highest price \$62. Five

Berkshire swine brought \$117, average \$23.40. Sheep were sold as follows: 2 Oxford shearing ewes \$54, 4 Southdown shearing ewes \$108, 3 Leicester ram lambs \$63, and 4 Shropshire ram lambs \$87. The Live Stock Branch at Toronto bought two head of fat cattle, one Shorthorn Angus steer weighing 1,770 lb., at 14½c., and one Shorthorn Hereford steer weighing 1,750 lb., at 11c. Both were calved in September, 1914. The total amount reached by the sale was \$7,725.15.

ALBERTA**BY E. L. RICHARDSON, SECREATARY ALBERTA CATTLE, SHEEP AND SWINE BREEDERS' ASSOCIATION**

THE sale of dairy cattle, sheep and swine held under the auspices of the Alberta Cattle, Sheep and Swine Breeders' Associations at Calgary, October 17th to 19th, while all the animals entered were not disposed of, was a better success than anticipated for the first annual sale of this kind. It was found that there was very little market for lamb rams or for dairy bulls. No doubt the price of grain at the present time somewhat adversely affected the sale of hogs. There is reason to believe, however, that this autumn sale will develop into an important annual event of considerable benefit to the stock interests of Alberta. Our next new venture in this line will be the sale of beef females to be held by the Alberta Cattle Breeders' Association at our forthcoming Alberta Winter fair, December 12th to 15th. In addition to beef females being accepted for sale, the sale will be open to breeders from Alberta who have entered stock in the fat stock show.

A summary of the prices obtained at the recent sale shows the following averages:

		Average
Cattle	29 Dairy females	\$100 00
	10 " males	56 50
Sheep	20 Oxford ewes	\$ 41 12
	20 " rams	47 65
	20 Shropshire ewes	23 40
	43 " rams	26 42
	12 Suffolk rams	23 75
	20 Grade ewes	7 45
Swine	11 Berkshire sows	\$ 24 63
	17 " boars	27 41
	7 Duroc Jersey sows	21 00
	8 " boars	31 00
	4 Poland China sows	21 50
	1 " boar	31 00
	6 Yorkshire sows	29 83
	1 " boar	19 00

Excluding the grades, 121 sheep were sold, as above, at an average of \$30.85 and 55 swine at an average of \$26.30.

NEW PUBLICATIONS

THE DOMINION DEPARTMENT OF
AGRICULTURETHE DOMINION EXPERIMENTAL
FARMS

Seasonable Hints for November, December, January, and February contains advice on the profitable disposal of harvested produce and on planning and preparing for 1917. The following points are emphasized by the Director in his introduction:

"Direct marketing of all or most of the raw products from the farm is a mistake. It demoralizes the farmer, exhausts the farm and impoverishes the commonwealth." To this is added the explanation: "Every farmer should aim to convert at least one-half, or, better still, two-thirds, or even more of his crop into concentrated or finished form before selling."

"A little more thought and preparation when nights are long means less lost time and more effective work when days are bright and warm and every minute counts."

Among the contributors are the Animal Husbandman, who directs particular attention to the facts that the best grade of feed is the cheapest, that the use of poor bulls means bankruptcy and that over-feeding is a main source of loss; the Dominion Chemist, who is emphatic in his suggestion that "manure makes the farmer independent of the vagaries of the season" and that leaving manure loose in the yard in winter is wasteful; Assistant Dominion Agrostologist Browne, who deals with the seed supply for forage crops; the Dominion Cerealists, who black letters advice to "Change only when you are sure you are getting something superior to your old stock;" the Dominion Botanist, who says "one year's seeding may mean seven years' weeding, so sow clean seed;" Assistant Field Husbandman Graham, who counsels on field crops; the Dominion Horticulturist, who treats of fruits, flowers and vegetables; the Dominion Apiarist, the Dominion Tobacco Husbandman and Assistant Poultry Husbandman Robertson. "Useful Facts for Farmers" on the last two pages treats of weights and measures.

Feeding for Beef in Alberta, Bulletin No. 30, second series. Messrs. G. H. Hutton, B.S.A., Superintendent of the Experimental Station at Lacombe, Alta., and W. H. Fairfield, M.S., Superintendent of the Experimental Station at Lethbridge, Alta., here detail the results of experiments from 1909 to 1915 in their precincts. Part I is devoted to Lacombe

and Part II to Lethbridge. The experiments at Lacombe related to the cost of feeding, the ration fed, receipts and types of steers fed. The experiments at Lethbridge covered three years, namely 1912-13, 1913-14 and 1914-15, while those at Lacombe took in also 1910-11, 1911-12 and 1912-13. Again the experiments at Lethbridge were devoted mainly to ascertaining the relative feeding value of alfalfa, those conducted at Lacombe being of a wider range. These experiments brought out a variety of interesting facts consideration of which should well repay the farmers of Alberta. Illustrations show views and buildings at the Stations, types of steers fed, and the equipment employed.

THR DIVISION OF BOTANY

Flax for Fibre: Its Cultivation and Handling, by J. Adams, M.A., Assistant Dominion Botanist; Bulletin No. 28; second series. Having for years been associated with the flax industry in Ireland, Mr. Adams is exceptionally well fitted to write this bulletin. Commencing with a brief outline of the history of flax cultivation, he proceeds to tell of its production in Ireland, showing that although its cultivation in that country had receded in quantity from the 301,693 acres covered in 1864 it had begun to pick up again. Russia up to the time of the war was the greatest producing country of flax, upwards of three million acres being devoted to its growth. The late Dr. Wm. Saunders, as Director of the Dominion Experimental Farms, published two bulletins relating to this subject and Dr. C. E. Saunders, Dominion Cerealists, has been engaged for a number of years in experiments with selected strains. After narrating these facts, Mr. Adams proceeds, with drawings and diagrams, to describe the nature of the plant and to tell of the climate and soil best suited to its growth, the qualities that the seed should possess, the amount that should be sown, the methods of cultivation that should be followed, the weeds that infest it and the diseases that affect it. He treats of the harvesting, the removal of the seed, the retting or steeping, the yield of fibre and seed and recent obtainable prices, which show a decidedly rising tendency.

THE HEALTH OF ANIMALS BRANCH

Veterinary Director General's Report for the year ending March 31st, 1915. In common with other Branches of the public service the Veterinary Director General, Dr. Torrance, states that the war has had its effect on the Branch, many veterinary inspectors having felt it their duty to

answer the call of the country. The doctor adds that had not every member of the staff been willing to do even more than his duty it would have been well nigh impossible to carry on the work as efficiently as desired. The report with 7 or 8 pages of appropriate illustrations makes a blue book of 140 pages. Besides a brief summary—with statistics, appointments, etc.—of the work accomplished the Veterinary Director General gives some account of his attendance at the Tenth Intercolonial Veterinary Congress, held in London, Eng., during the week in August, 1914, that witnessed the outbreak of war. In the appendices not only are reports of the chiefs of divisions and of inspectors of provinces and districts given but several valuable papers by the Pathologist of the Branch and his assistants are published. A paper on the care, sanitation and feeding of foxes in captivity is particularly noteworthy.

THE FRUIT BRANCH

Fruit Crop Report, No. 5, besides describing weather conditions during July and August and detailing the fruit situation in provinces and districts and noting prices received, gives directions for sending specimens of insects to the Dominion Entomologist and of bacterial or fungous diseases to the Dominion Botanist.

THE PROVINCIAL DEPARTMENTS OF AGRICULTURE

PRINCE EDWARD ISLAND

Rural Science Note Book. With this book, recently issued by the Department of Education of the province, instructions are given as to the records, notes and reports that should be kept on nature study, school gardening and home products, elementary agriculture and elementary science. It is designed not alone to impress facts on the minds of the pupil, but also to create a disposition for order and method.

Report on Rural Science Instruction. Instructions and suggestions are given in this report regarding the requirements for special grants to teachers from the funds appropriated under THE AGRICULTURAL INSTRUCTION ACT. Nature study, gardening for children, pupils' projects and school projects during the different months are the subjects dealt with.

QUEBEC

Bulletin No. 23 of the Quebec Department of Agriculture is entitled *Les Principales especes d'Insectes Nuisibles et de Maladies Vegetables* and is written by le Chanôine V.-A. Huard, A.M., of the Royal

Society of Canada, director of the Canadian Naturalist and Provincial Entomologist.

L'Etat Des Recoltes dans la Province of Quebec October, 1916, is the title of a bulletin recently published by the Quebec Department of Agriculture. This bulletin contains reports on the condition of the various crops throughout the province.

Dairymen's Association and Dairy School Report. The thirty-fourth annual report of the Dairymen's Association and Dairy School of the province of Quebec makes a book of 310 pages. Besides the report of Mr. O. E. Dalaire, who fills the dual position of Director of the Dairy School and Secretary-Treasurer of the Dairymen's Association, provincial legislation affecting the dairy interests is given, followed by notes on milk and cream tests, a full list of the butter and cheese factories in the fifty divisions of the province that are compulsorily inspected, a list of paid-up members of the Dairymen's Association and complete details of the thirty-fourth convention held at Farnham, Mississquoi County, on December 1 and 2, 1915.

Macdonald College Circulars. For general distribution, especially at exhibitions, Macdonald College, following an annual custom, recently issued a series of seven circulars prepared by professors and experts connected with the College, dealing not only with its own activities but supplying valuable instruction and suggestions regarding all branches of farming, vegetable cultivation and fruit growing. The first circular dealt with feeding value, adaptation, cultural methods and seed production, the second with control of some noxious weeds, the third with egg production in Quebec, the fourth with alfalfa growing in Quebec, the fifth with fruits, vegetables, trees, shrubs and flowers recommended for cultivation by the horticultural department of the college, the sixth with care of the apple orchard, and the seventh with sheep raising.

ONTARIO

Annual Reports of the Dairymen's Associations, 1915. It takes a blue book of 128 pages to record matters affecting the Eastern and Western dairymen's associations and the dairy schools at Guelph and Kingston. A deal of information is given regarding the care and feeding of cows, testing possibilities, dairying possibilities, work of the dairy instructors, the making of cheese and butter, the various dairy herds with records of yields of milk and fat, cream grading, the use of rennet, the value of casein-fat, cream grading and standards of butter. Leading agricultural officials and experts contributed the papers. The statistical tables of analyses and records are especially interesting.

Ontario Veterinary College Report, 1915. The most noticeable and notable feature of this report is the complete text of the speech delivered by the late Dr. C. C. James at the opening exercises for the 1915-16 term. Dr. James traced the history of the college from its foundation by the late Hon. Adam Ferguson, a sketch of whose career in connection with agriculture in Canada he also gave. After the calendar of the college the prize essays of the first and second year students are given, followed by a synopsis of methods adopted in teaching various branches of veterinary science. As in the preceding year, so in 1915 enlistments in the war had some effect upon the number of students, of the 290 of whom 211 were Canadians and 67 from the United States, the remaining 12 being from abroad. The report notes that 75 of the students have gone in for military training with the Officers' Training Corps of Toronto University.

Women's Institutes Annual Report. Part I of the annual report of George A. Putnam, Superintendent of Women's Institutes in Ontario, comprises 192 pages devoted mainly to reports in detail of the proceedings at the Eastern convention, held at Ottawa, October 27 and 28, average attendance 250, the Western convention, held at London, November 3 and 4, average attendance 350, and the Central convention, held at Toronto, November 10, 11 and 12, average attendance 575. It is not necessary to say that in these reports, which chronicle addresses delivered by many leading men and women, a vast deal of interest and instructive matter will be found. By reading them a better appreciation, perhaps, than can be found in any other way, will be obtained of the great service that the women of the land are rendering as regards the war. Of particular moment are the accounts given of the work done in connection with the Red Cross, the Belgian and other relief funds. Mr. Putnam has prepared a remarkably concise and complete table of the strength and operations of the more than a hundred different institute districts that come under his supervision. From this table it would appear that North Brant with 652 can boast the largest number of members, but that East Lambton, with 566 members, and Peel, with 645 members, from a financial point of view share the honour of being the most prosperous.

MANITOBA

Home Economics Handbook. Mr. S. T. Newton, Superintendent of Extension Service, Manitoba Agricultural College, has here made a valuable contribution to the Manitoba Farmers' Library. The work is a 24-page pamphlet setting forth the purposes of Home Economics' Societies

and giving their constitution and rules of procedure. The provincial Act respecting such societies is printed in full. A description of the two hundred and odd co-operative short courses held in the province last year in connection with the Home Economic Societies follows, with particulars of the various subjects taught and advice as to accommodation and arrangements. A few words on package and exchange libraries, co-operation and extension and a list of the societies make up the tale of the Handbook.

Winter Feeding of Cattle, by F. S. Jacobs, B.S.A., Professor of Animal Husbandry, Manitoba Agricultural College. In an eight-page circular Professor Jacobs tells what can and cannot be done with rusted and unthreshed grain. He points plainly and directly to the profit that might accrue from feeding and finishing cattle at home rather than letting them go into the United States for the purpose. Illustrations that emphasize the situation are given of well-bred and fairly well-bred steers of a character that the circular says are going into the United States every week from the Winnipeg stock yards for further development and fattening. The photographs, it might be mentioned, were taken as late as the middle of September, this year. The professor shows how much of an otherwise entirely wasted crop could be utilized as fodder and help to check this constant drain upon the live stock of the country.

SASKATCHEWAN

The Fourth Annual Report of the Live Stock Commissioner of Saskatchewan for the sixteen months ended April 30th, 1916, shows that horses increased in 1915 compared with 1914 by 23,408, milch cows by 19,546, other cattle by 31,517 and sheep by 14,272. Swine decreased 148,114, or from 477,360 to 329,246. The Commissioner looks for an improved demand both for horses and cattle, especially for the latter. The call for pure-bred breeding stock, he says, was never before so insistent as it was this spring. The whole report is of an optimistic nature and contains a mass of information relating to prices, marketing, treatment of stock, distribution of pure-bred animals, stallion enrolment, health of animals and operations of the different breeders' associations.

The Tenth Annual Report of the Dairy Commissioner of Saskatchewan, covering the sixteen months ending April 30th, 1916, besides recording the progress of butter making in the province, chronicling prices and quantities for ten years back, detailing operations of creameries and recording the results of cow-testing, contains a full report of the seventh annual convention of the

Saskatchewan Dairymen's Association, held at Saskatoon, January 5th and 6th, 1916. An important resolution passed at this convention favoured the establishment of abattoirs under Government supervision on the same plan as co-operative elevators and creameries have been established.

Among the series of annual reports recently issued by the Saskatchewan Department of Agriculture, covering sixteen months ending April 30th, 1916, are the fifth annual report of the Bureau of Labour, the ninth annual report of the Secretary of Statistics and a report by the Chief Game Guardian. Regarding farm labour the report of the Bureau of Labour states that "whilst wages were slightly higher than in other years, averaging \$40 per month at the opening of the spring and \$45 per month when work became general, nevertheless, the bureau was successful in securing a sufficient number of men to fill all applications for help."

ALBERTA

Technical Education, Bulletin No. 1, relating to special grants, regulations and organization. Section I refers to instruction in science, agriculture and school gardening. Provision is made in rural and village school districts for an annual grant of 50 per cent on expenditure for improvement and up-keep of school garden and up to \$15 for equipment and for an annual grant of \$25 to each teacher. In towns and cities the terms are the same except that teachers receive an annual grant of \$50 and that \$75 is allowed on equipment. Section II deals with instruction in manual training. In village districts an annual grant up to \$15 is made on approved equipment and \$20 to teachers. In towns and cities ten per cent is to be allowed annually on approved equipment, the maximum grant being \$100, and \$50 to teachers. Section III provides for similar grants for household science and art. Section IV arranges for grants to night schools on an increased scale and section V and VI for grants for vocational and primary classes. Other parts of the bulletin deal with organization matters.

Agriculture and Gardening in Elementary Schools. There is very little worth knowing about the principles and methods of school gardening, suitable for junior schools, that is not touched upon in this 125-page bulletin issued by the Department of Education of the province. The introductory statement to the bulletin very correctly says: "Apart from their human environment there is nothing more helpful to children, or to which child nature responds more truly and naturally, than a personal relationship with animals and

growing plants." Having said this among other things as a prelude, the bulletin proceeds to state the progress that has been made in nature study and elementary gardening, to define the steps taken to prepare the teacher, to give the schedule of grants and the regulations governing the same and to outline the course of study. Suggestions to teachers follow as to classification of subjects, methods of instruction and forms of questions to pupils. Outlines of plans of gardens are given along with a statement of the implements of equipment required. Selection of seed, preparation of the soil, sowing, cultivation, the nature of plants, harvesting, care of the garden during vacation and home gardening are all dealt with. A score or more illustrations interleave the text.

Department of Agriculture Report, 1915. The annual report of the Department of Agriculture of the province of Alberta for 1915 makes a comprehensive volume of 324 pages with a number of full-page and half-page illustrations. It deals with the most productive year the province has ever known and consequently is generally of an exceptionally optimistic character. Among other indications of progress are noted an increased demand for good breeding stock, an increase of 35.48 per cent in dairying, particularly relative to butter-making, great advance of women's institutes, which almost trebled in number during the year, and considerable extension in educational work. Mention is made of the fact that a farm book-keeping book is to be had at cost of production. Another book issued by the Department provides for the keeping of household accounts. Increased attendance is reported at the agricultural schools of the province, the number of pupils having grown from 234 in 1913-14 to 337 in 1915-16. Several interesting papers are given in the Dairy Commissioner's report, which embodies a full report of the Dairymen's convention, among the contributors being the Chief of the Dairy Division at Ottawa and the Superintendent of the experimental station at Lacombe. The activities of all the breeders' associations are recorded.

BRITISH COLUMBIA

Exhibiting Fruit and Vegetables, by R. M. Winslow, B.S.A., Provincial Horticulturist and Inspector of Fruit Pests; Bulletin No. 48 (second edition). It is not difficult to believe that, as the letter of transmittal from the Deputy Minister of Agriculture states, the first edition of this bulletin, which has been exhausted, was instrumental in improving the character of exhibits at fall fairs. A prime difficulty experienced by fair managers has always been the arranging of exhibits to the greatest ad-

vantage. This 40-page bulletin gives a quantity of useful information in this direction. Mr. Winslow, however, has not written so much for the benefit of exhibition managers as for intending exhibitors, who are fully instructed on prize-winning standards and the preparation of exhibits. Score-card points for different varieties of fruit and vegetables are supplied, the advisable arrangement of prize lists indicated and desirable rules and regulations set forth.

Tenth Annual Report of the Dairymen's Association. The year ending December 31st, 1915, is covered by this report, which, besides chronicling in complete detail the proceedings of the annual convention held at New Westminster January 27 and 28, 1916, gives lists of prize winners, a statement of records, methods adopted in scoring for awards, the constitution and by-laws of the association and a series of appropriate illustrations.

MISCELLANEOUS

The Clydesdale Stud Book. Volume XXIV is now in course of distribution

from the office of the Canadian National Live Stock Records, Ottawa. It gives the stallions recorded from 16,561 to 17,419 and the mares from 34,038 to 35,689. Among the other contents are lists of the officers of the association, of the presidents, vice-presidents and secretary-treasurers from the inception of the association in 1886 and of the members, the rules of entry, the minutes of the 29th annual meeting held this year, complete indices, and lists of awards at 22 of the leading exhibitions in Canada.

A Review of the Status and Possibilities of Flax Production and Manipulation in Canada, by James A. MacCracken, Secretary of the Canadian Flax Growers' Association. The production of flax in Canada varies apparently by no set rule. Mr. MacCracken sketches the early efforts at flax growing in this country and then proceeds to deal with new phases of the industry, the suitability of Canada's soil and climate, the choice and cultivation of the flax field, seeding, sowing, harvesting, grading, threshing, retting, final operations in the mill and marketing. Analytical tables, tables of cost and so on, with illustrations, increase the value of the bulletin.

NOTES

Over 12,000 people attended the annual picnic held by the Welland County Board of Agriculture, Ontario.

There are in California 175 farm bureau centres established in fourteen counties. These farm bureau centres have a regular and permanent organization which is linked together in a county system and, through the Agricultural College, becomes a state-wide institution.

At the annual meeting of the St. Lawrence Valley Fruit Growers' Association recently held at Morrisburg, Ontario, it was decided to begin co-operative marketing of fruit. A manager was appointed and seven or eight of the largest fruit-growers arranged to ship their products co-operatively.

A teachers' winter short course will be held at Sussex and Woodstock, New Brunswick, beginning January 8th, 1917. Teachers who have attended rural science schools or the winter short course in January last are eligible for admission. The subjects of the nature study and agricultural course will be dealt with.

The boys' and girls' clubs of Manitoba have held over 100 school fairs. A noteworthy feature of this movement is the great progress everywhere in evidence; an ample proof being given at the fair held at Gunton, which was very largely attended, 650 or 700 visitors having been carried on a special train. As an instance of the enterprise of the boys and girls, it may be noted, that at one place they reared and were prepared to exhibit over 60 pigs, bought with their own money, which had been loaned to them by the local bank manager.

The last of a series of six school fairs conducted by the Alberta Department of Agriculture was held at the Sedgewick Demonstration Farm on September 19th. The pupils of thirteen schools competed. The attendance was about six hundred. The programme for the day included addresses by leading officials of the provincial Department of Agriculture. The exhibits of vegetables, chickens and grains were the produce of seed and eggs supplied through the Department last spring. The exhibits also included a number of foals and calves cared for by the boys and girls. Another section of the fair included specimens of mounted weeds, native plants and insects co-operatively collected by the pupils under the direction of the teachers.

A. G. Harris, Pomologist of the Horticultural Experiment Station, Vineland, Ont., has resigned his position to take up the management of a large fruit plantation in Colorado.

A phenomenal sale of Guernsey cattle took place recently on the Langwater farms, near North Easton, Mass. Seventy-four head brought an average of \$1,051 apiece. The top price was \$6,150, paid for Langwater Dairymaid, which is a record. Sixteen daughters of the imported bull King of the May brought \$31,500, an average of \$1,968.75 per head.

A farm-management club in Washington County, R.I. made a farm survey in the district. A number of the boys in the district will keep records of their fathers' farms. An inventory of the farms was taken April 1st, 1916, and another will be taken April 1st, 1917. The boys keep record sheets for both men and horses, also records of individual work with poultry and the dairy.

The Lansdowne Farmers' Association, with headquarters at Lansdowne, Ontario, recently secured a building to be used for crate fattening, killing and packing poultry. The building will accommodate 600 to 700 birds in crates, as well as provide room for killing and packing. The Association plans to erect a warehouse during the coming year, for which purpose a committee has been appointed for the drafting of plans, etc.

Mr. C. W. Buchanan, B.S.A., District Representative of the Ontario Department of Agriculture for Elgin County, reports a successful farmers' auto excursion and picnic from West Elgin to East Elgin. Over fifty automobiles were assembled for the occasion, all of which covered a distance of over eighty miles. Several farms were visited and inspected which resulted in much discussion of particular methods followed on the farms.

The executive of the County Board of Agriculture, Brant County, Ontario, has arranged its winter programme, which will include four short courses, four special and six regular institute meetings. The executive also contributed \$6 as prizes for a live stock judging competition for young men under 25 years of age at each of the four short courses, the provision being made that five competitors at least must enter each competition.

The Fruit Branch of the Ontario Department of Agriculture will this year send overseas for the use of the army hospitals and navy, 20,000 boxes of apples, 35,000 gallons of peaches and over 10,000 pounds of jam. The orchards leased by the Fruit Branch for experimental purposes will furnish several thousand boxes of apples, while the orchard of the Horticultural Experiment Station at Vineland will contribute largely to the cannery.

As a result of the efforts of the Horticultural Society at Hamilton, Ontario, to secure protection of bird life a number of prosecutions have taken place for the shooting of birds within the city limits. In the early cases the offenders were warned and their guns confiscated while in later cases fines have also been imposed. The first fines amounted to two dollars each but as high as ten dollars has been assessed in later instances.

As a result of representations made by the combined farmers' organizations of the three prairie provinces, the three leading railway companies operating therein, have agreed to give a specially reduced rate on cattle for breeding, feeding or finishing. These rates amounting to twenty-five per cent below the ordinary rates, apply from Calgary, Edmonton, Moose Jaw, Saskatoon and Winnipeg to points in Manitoba, Saskatchewan and Alberta.

The Prince Edward Island Department of Agriculture is asking the teachers of the rural schools to make, through their pupils, a sheep census of the province. This is part of the rural science work. The information required from every school section is:

- (1) The names of all farmers keeping sheep;
- (2) The number of lambs owned by each farmer keeping sheep,
- (3) The number of other sheep owned by each farmer;
- (4) The number of pure-bred sheep that may form part of numbers 2 and 3.

Some 250 representatives of the Scottish Chamber of Agriculture, the Highland and Agricultural Society of Scotland, the National Farmers' Union of Scotland, the Scottish Agricultural Organization Society, the Farm Servants' Union and the Agricultural Colleges met in conference in Glasgow to discuss the bearing of the present national situation on their special problems. The keynote of all the speeches and discussions was the need of organization, and the establishment of a central representative body which would speak and act for the industry as a whole. A preliminary committee was formed to report on the best means for doing this.

INDEX TO PERIODICAL LITERATURE

- Journal of the Canadian Peat Society*, Ottawa, June, 1916.
Bacterized Peat—A New Fertilizer, page 27.
Peat and the War, page 62.
- Weekly News Letter*, Washington, D.C., September 27, 1916.
Feed Balanced Ration. Profitable Feeding of Dairy Cows Consists of Supplementing Roughages with Proper Grain Mixtures, page 1.
- The Prairie Farm and Home*, Regina, Sask., September 13, 1916.
The Protection of Birds in Canada, W. E. Saunders of the Ornithological Club, London, Ont., page 2.
- The Fruit Bulletin*, British Columbia Department of Agriculture, September 16, 1916.
Every Fruit Grower Should Send Apples to the Calgary Show, page 1.
- The Farmers' Magazine*, Toronto, Ont., October, 1916.
Preparedness for Crop Production, C. A. Zavitz, page 7.
What Will Live Stock Do? All seem to Agree that the Present World War Will Create a Demand That Will Last Long, page 22.
- The Farmers' Advocate*, Winnipeg, Man., October 11, 1916.
Starting the Farm Flock, Professor W. H. J. Tisdale, University of Saskatchewan, page 1393.
- The Farmer's Advocate*, London, Ont., October 12, 1916.
Canada's Young Farmers and Future Leaders, page 1689.
- The Farm and Ranch Review*, Calgary, Alta., October 5, 1916.
Farm Poultry. Winter Egg Production, W. A. Brown, B.S.A., page 730.
Real and Imagined Difficulties in Successful Agricultural Co-Operation, T. A. Benson, Dominion Poultry Representative, Edmonton, Alta., page 719.
- The Canadian Countryman*, Toronto, Ont., October 14, 1916.
Finishing Poultry for a Profitable Market, George Robertson of the Poultry Division, Ottawa, page 3.
Your First Step in Successful Co-Operation, Frank C. Hart, page 5.
- The Canadian Horticulturist and Beekeeper*, Peterboro, Ont., October, 1916.
Small Fruit Packages and Packing, C. W. Baxter, Chief Fruit Inspector, Dominion Fruit Division, Ottawa, page 237.
The Canadian vs. the American Standard Apple Box, A. H. Flack, Chief Fruit Inspector for Prairie Provinces, page 242.
- The Farm and Dairy and Rural Home*, Peterboro, Ont., October 12, 1916.
Artificial Laws Control the Prosperity of the Farmer, His Wealth Can Be Taken From Him Without His Knowledge.—How is it Done?—Why he Should Understand these Matters. Roderick MacKenzie, Secretary, Canadian Council of Agriculture, page 3.
- The Agricultural Journal*, Victoria, B.C., October, 1916.
Chard Should Prove to be Particularly Useful as a Forage-Crop, Professor L. Stevenson, Superintendent, Dominion Experimental Station, Sidney, B.C., page 125.
- The Canadian Countryman*, Toronto, Ont., October 21st, 1916.
Why Every Farmer Should Raise Sheep, D. E. McEwan, page 1327.
Probable Effects of the Present Dairy Boom, Professor H. H. Dean, page 1329.
- Farmers' Advocate and Home Journal*, Winnipeg, Man., October 18th, 1916.
Next Step for the Grain Farmer. Opinions of Men in Different Parts of the Prairie Provinces who are Large Grain Growers, page 1427.

VOL. 3, No. 12



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DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE

The Agricultural Gazette of Canada

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CONTENTS

	PAGE
Agricultural Legislation in 1916.	1031
The Protection of Migratory Birds in Canada, by C. Gordon Hewitt.	1032
The Potato Export Trade.	1036

PART I

DOMINION DEPARTMENT OF AGRICULTURE

The Dominion Experimental Farms:—	
The Horticultural Division:	
Canadian Maples to Mark Canadian Graves in France, by W. T. Macoun.	1038
The Division of Apiculture:	
Recent Work of the Bee Division, by F. W. L. Sladen.	1041
The Entomological Branch:	
The Fumigation and Inspection of Imported Nursery Stock Under Federal Legislation, by Arthur Gibson.	1046
The Fruit Branch:	
The Sale of Canadian Apples in Great Britain, by F. H. Grindley.	1052
The Live Stock Branch:	
Prices for Wool in the Fleece at Canadian Fairs, by T. Reg. Arkell.	1055
The Seed Branch:	
Seed Potatoes for 1917, by G. LeLacheur.	1057
Dominion Department of Agriculture Honour Roll.	1058

PART II

THE PROVINCIAL DEPARTMENTS OF AGRICULTURE

Agriculture in Canada:—	
Alberta, by J. McCaig.	1061
British Columbia, by Wm. E. Scott.	1071
The Inspection of Nursery Stock:—	
Nova Scotia, by W. H. Brittain.	1083
Ontario, by L. Caesar.	1084
British Columbia, by R. M. Winslow.	1085
New Brunswick:—	
Agricultural Legislation, by J. B. Daggett.	1087
Notes.	1088
Quebec:—	
The School Gardens' Association of America, by Jean-Charles Magnan.	1088
Ontario:—	
The Late Honourable J. S. Duff, Minister of Agriculture.	1089
Saskatchewan:—	
Protection of Prairie Fowl.	1090
Exporting Butter to England.	1091
Dry Farming Congress.	1091
British Columbia:—	
Agricultural Credit.	1092
Fifth International Egg Laying Contest at Victoria.	1092

PART III

RURAL SCIENCE

The Teaching of Household Science:—

Nova Scotia:

Department of Education, supplied by A. H. MacKay	1093
The Department of Agriculture, by M. Cumming	1094

Ontario:

Household Science at Toronto University	1094
Macdonald Institute, by Miss Mary M. Watson	1097
The Manitoba Agricultural College, by J. B. Reynolds	1099
Saskatchewan, by Miss F. A. Twiss	1100
University of Saskatchewan, by Walter Murray	1102

Alberta:

Department of Education, by Jas. C. Miller	1102
Department of Agriculture, by Jas. McCaig	1102

New Brunswick:—

Fourth Annual Convention of Women's Institutes	1104
--	------

British Columbia:—

Agriculture in High Schools, by J. W. Gibson	1105
--	------

PART IV

SPECIAL CONTRIBUTIONS, REPORTS OF AGRICULTURAL ORGANIZATIONS, NOTES AND PUBLICATIONS

Canada's Wheat Problem	1106
Loans for Buying Cattle	1107
Student Enrolment	1108
Associations and Societies	1110
New Publications	1113
Notes..	1116
Index to Periodical Literature...	1119

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AGRICULTURAL LEGISLATION IN 1916

AS the basic industry of the country, agriculture naturally is the subject of much legislation. In this connection it is noteworthy that federal and provincial activities in the way of beneficial agricultural legislation have been greatly increased in the last four or five years. Especially has the progress been marked in measures having for their object the further instruction of the young in matters pertaining to the farm, to the garden and to the home. Most prominent of the measures of this class is THE AGRICULTURAL INSTRUCTION ACT, 1913, which provides for grants to the provinces for work of all kinds in agricultural instruction. The total grant to the provinces in 1916-17 is \$1,000,000, and in 1917-18 it will be \$1,100,000, at which figure it will remain for the balance of the ten years during which the act is in operation.

The agricultural legislation in 1916 can hardly be said to have been extensive, but it has been of an especially useful nature, with a tendency to promote those interests which at the moment are attracting the greatest attention and are of major importance. There are at this juncture no branches of agriculture more in the public mind than live stock and dairying: there are no interests of more vital concern to the country. Thus we find not only that an amendment to The Bank Act of the Dominion, passed at the last session of Parliament, provides that a bank may lend money to a farmer and to any person engaged in stock raising upon the security of his live stock, but that several acts of the legislatures, and operations of the various divisions of Government, tend to develop those branches. New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan and Alberta all adopted measures affecting the breeding and keeping of stock, while dairying engaged the legislative attention of Prince Edward Island, Nova Scotia, Ontario, Manitoba, Saskatchewan and British Columbia.

The suppression of noxious weeds received attention in Manitoba, improved drainage in Prince Edward Island, women's institutes in Alberta and the providing of homesteads and homestead loans for returned soldiers in New Brunswick and British Columbia.

THE PROTECTION OF MIGRATORY BIRDS IN CANADA

AN ACCOUNT OF THE INTERNATIONAL TREATY OF 1916 BETWEEN GREAT BRITAIN AND THE UNITED STATES FOR THE PROTECTION OF MIGRATORY BIRDS IN THE UNITED STATES AND CANADA

BY C. GORDON HEWITT, D.Sc., DOMINION ENTOMOLOGIST

FOR many years the numbers of our migratory birds such as ducks, geese, insectivorous birds and shorebirds, which class includes the plovers, sandpipers, snipe, woodcock, etc., have been decreasing. This decrease is a matter of common knowledge and observation throughout the Dominion. Certain of these migratory birds, such as the Eskimo plover, which formerly existed in enormous numbers and was killed for the market, the Labrador duck, the passenger pigeon and the great auk have now become extinct. Others such as the whooping crane and the wood duck, the most beautiful of our native ducks, have become so reduced in numbers as to render their continued existence without further protection a matter of doubt.

From a national standpoint the prospect of this continued decrease involved serious economic considerations. Leaving out of account the value from an æsthetic point of view of this portion of our Canadian wild life, great as that is, and regarding it as an economic asset to the country, we were faced with the gradual reduction of our migratory wild-fowl, whose value as food and as means of securing recreation are inestimable, and of our insectivorous birds, which are of even greater importance to the welfare of our agricultural interests.

Insectivorous birds constitute one of the chief natural agencies controlling insect pests affecting field

crops, orchards and forests. In field crops alone the annual loss in Canada due to the depredations of insect pests is, on a conservative estimate, not less than \$125,000,000. And, with the development of the country, the damage caused by insect pests is increasing, while the numbers of insectivorous birds have been decreasing.

The chief causes of this decrease in the numbers of our migratory birds are as follows: Canada constitutes the chief breeding place for the greater number of these birds. With the settlement of the country the breeding places of many species have been destroyed. The clearing of the land has involved the clearing of the nesting sites of insectivorous birds; the draining of marshy areas and the settlement of the prairies have driven wild-fowl from their former breeding and feeding places. Such causes are, therefore, unavoidable to a large extent. On the other hand, while many of the provinces have excellent laws governing the protection of game, non-game and insectivorous birds, it has not always been possible to give these birds adequate protection. The increase in the number of persons who carry guns and the improvement of modern sporting guns have had their effect on the abundance of wild-fowl.

Even with the strictest enforcement of protective laws Canadians would have been unable to prevent the continued decrease of migratory birds unless the requisite protection

were given to such birds during the time that they are in United States territory. In other words, our migratory birds cannot be adequately protected from continued decrease without co-operative protection in Canada and the United States.

It is a well-known fact that while some of the states of the Union had excellent laws, which they enforced, others failed to protect their birds. In some states the shooting of wild fowl in the spring was permitted; this involved the killing of birds, usually mated at that time of the year, on their way to their breeding grounds in the north. This discouraged many Canadians, who naturally asked why they should protect their wild-fowl for the market gunners in the south. The existence of such market gunners, who annually killed enormous quantities of Canadian-bred ducks and geese for the markets of the big cities in the United States, constituted one of the greatest causes of reduction and one of the chief obstacles to any rational attempt to prevent such reduction and to maintain our stock of wild-fowl. Not only were game birds affected, but insectivorous birds were likewise killed by thousands during their winter sojourn in the south; this destruction has been particularly serious in the case of the robin, one of our important cutworm destroyers.

As a result of the efforts of sportsmen, game protective associations and other organizations interested in the conservation of the wild fowl and other migratory birds in the United States, the Federal Migratory Bird Law was enacted in 1913 for the purpose of securing more adequate protection for migratory birds which by reason of their migratory habits could not be successfully protected by the efforts of individual states so long as other states were derelict in the matter. The objects of the Federal regulations were: To reduce the open

seasons, which varied greatly in different states; to secure a more uniform open season, not exceeding three and one-half months, fixed in accordance with local conditions, so that the sportsmen would have shooting at the best time of the year; and to prevent the shooting of migratory birds in the spring. A close season for a period of years was given to certain birds, particularly shorebirds, and the shooting of insectivorous birds was entirely forbidden. The majority of the states amended their laws to conform with the Federal regulations, and although certain states, in which the influence of the market hunter and gunners with no thought of the future appeared to predominate, objected to Federal interference, the outcome of this increased protection and elimination of spring shooting has been a noticeable increase in the numbers of wild fowl. This increase has also been observed by Canadian sportsmen.

The results of the Federal Migratory Bird Law in the United States indicated the possibilities and served to emphasize the need of international co-operation. The question of international co-operation was first informally discussed by the writer with the Biological Survey of the United States Department of Agriculture at Washington in January, 1914. Later in the same month the subject was discussed in Ottawa at the annual meeting of the Commission of Conservation and the following resolution was passed:

"Resolved, that the Provincial Governments of Canada be urged to solicit the good offices of the Dominion Government in obtaining the negotiation of a convention for a treaty between Great Britain and the United States, for the purpose of securing more effective protection for the birds which pass from one country to another."

In the following month (February, 1914) the United States Government submitted to the Canadian government for its consideration the draft of a convention between Great

Britain and the United States for the protection of migratory birds in the United States and Canada. The draft of the proposed convention was submitted to the several provincial governments for their views, as the question was of provincial concern. The provincial governments unanimously approved of the principle of the convention. As objections that were not considered to be insuperable were raised by only two of the provinces, and, as the Departments of Agriculture and of the Interior, and the Commission of Conservation, strongly concurred in the opinion that the protection of these birds, as provided under the proposed convention, particularly on economic grounds, was most desirable, an Order-in-Council was passed on May 31st, 1915, stating that the Canadian Government was favourably disposed to the conclusion of the proposed Treaty. With a view to securing the settlement of our objections to certain provisions of the treaty further negotiations were undertaken in Washington early in the present year, as a result of which all the objections raised were completely met with the exception of one that would have affected the vital principle of the proposed treaty, namely, the elimination of spring shooting. Accordingly, a revised draft convention embodying the changes, together with certain other improvements, was prepared and submitted to the Canadian Government in March, 1916. After further consideration of this revised draft by the Government an Order-in-Council was passed on the 29th June, 1916, stating that "Canada is prepared to agree to the conclusion of the convention" conditional to the adoption of certain other amendments which had been agreed to as a result of informal negotiation.

The treaty was signed in Washington on 16th August, 1916, by His Majesty's Ambassador, Sir Cecil Spring-Rice, G.C.V.O., and the Secretary of State of the United

States, Mr. Robert Lansing. On the unanimous vote of the Committee on Foreign Relations it was ratified by the Senate of the United States on 29th August, 1916.

Before giving the articles of the treaty it will be of interest to quote the words of the preamble:

"Whereas many species of birds in the course of their annual migrations traverse certain parts of the United States and the Dominion of Canada; and, whereas, many of these species are of great value as a source of food or in destroying insects which are injurious to forests and forage plants in the public domain, as well as to agricultural crops, in both the United States and Canada, but are nevertheless in danger of extermination through lack of adequate protection during the nesting season or while on their way to and from their breeding grounds;

"The United States of America and His Majesty the King of the United Kingdom of Great Britain and Ireland and of the British dominions beyond the seas, Emperor of India, being desirous of saving from indiscriminate slaughter and of insuring the preservation of such migratory birds as are either useful to man or are harmless, have resolved to adopt some uniform system of protection which shall effectively accomplish such objects. . . ."

The following are the articles of the treaty:

ARTICLE I

The High Contracting Powers declare that the migratory birds included in the terms of this convention shall be as follows:—

1. Migratory Game Birds:

- (a) Anatidæ or waterfowl, including brant, wild ducks, geese and swans.
- (b) Gruidæ or cranes, including little brown, sandhill, and whooping cranes.
- (c) Rallidæ or rails, including coots, gallinules and sora and other rails.
- (d) Limicolæ or shorebirds, including avocets, curlew, dowitchers, godwits, knots, oyster catchers, phalaropes, plovers, sandpipers, snipe, stilts, surf birds, turnstones, willet, woodcock, and yellowlegs.
- (e) Columbidae or pigeons, including doves and wild pigeons.

2. Migratory Insectivorous Birds: Bobolinks, catbirds, chickadees, cuckoos, flickers, flycatchers, grosbeaks, humming birds, kinglets, martins, meadowlarks, night-hawks or bull bats, nut-hatches, orioles,

robins, shrikes, swallows, swifts, tanagers, titmice, thrushes, vireos, warblers, waxwings, whippoorwills, woodpeckers, and wrens, and all other perching birds which feed entirely or chiefly on insects.

3. Other Migratory Nongame Birds: Auks, auklets, bitterns, fulmars, gannets, grebes, guillemots, gulls, herons, jaegers, loons, murre, petrels, puffins, shearwaters, and terns.

ARTICLE II

The High Contracting Powers agree that, as an effective means of preserving migratory birds there shall be established the following close seasons during which no hunting shall be done except for scientific or propagating purposes under permits issued by proper authorities.

1. The close season on migratory game birds shall be between March 10 and September 1, except that the close of the season on the Limicolæ or shorebirds in the Maritime Provinces of Canada and in those States of the United States bordering on the Atlantic Ocean which are situated wholly or in part north of Chesapeake Bay shall be between February 1 and August 15, and that Indians may take at any time scoters for food but not for sale. The season for hunting shall be further restricted to such period not exceeding three and one-half months as the High Contracting Powers may severally deem appropriate and define by law or regulation.

2. The close season on migratory insectivorous birds shall continue throughout the year.

3. The close season on other migratory nongame birds shall continue throughout the year, except that Eskimos and Indians may take at any season auks, auklets, guillemots, murre, and puffins, and their eggs for food and their skins for clothing, but the birds and eggs so taken shall not be sold or offered for sale.

ARTICLE III

The High Contracting Powers agree that during the period of ten years next following the going into effect of this convention, there shall be a continuous close season on the following migratory game birds, to-wit:

Band-tailed pigeons, little brown, sandhill and whooping cranes, swans, curlew and all shorebirds (except the black-breasted and golden plover, Wilson or jack snipe, woodcock, and the greater and lesser yellowlegs); provided that during such ten years the close seasons on cranes, swans and curlew in the province of British Columbia shall be made by the proper authorities of that province within the general dates and limitations elsewhere prescribed in this convention for the respective groups to which these birds belong.

ARTICLE IV

The High Contracting Powers agree that special protection shall be given the wood duck and the eider duck either (1) by a close season extending over a period of at least five years, or (2) by the establishment of refuges, or (3) by such other regulations as may be deemed appropriate.

ARTICLE V

The taking of nests or eggs of migratory game or insectivorous or nongame birds shall be prohibited, except for scientific or propagating purposes under such laws or regulations as the High Contracting Powers may severally deem appropriate.

ARTICLE VI

The High Contracting Powers agree that the shipment or export of migratory birds or their eggs from any State or Province, during the continuance of the close season in such State or Province, shall be prohibited except for scientific or propagating purposes, and the international traffic in any birds or eggs at such time captured, killed, taken or shipped at any time contrary to the laws of the State or Province in which the same were captured, killed, taken or shipped shall be likewise prohibited. Every package containing migratory birds or any parts thereof or any eggs of migratory birds transported, or offered for transportation from the Dominion of Canada into the United States or from the United States into the Dominion of Canada, shall have the name and address of the shipper and an accurate statement of the contents clearly marked on the outside of such package.

ARTICLE VII

Permits to kill any of the above-named birds which, under extraordinary conditions, may become seriously injurious to the agricultural or other interests in any particular community, may be issued by the proper authorities of the High Contracting Powers under suitable regulations prescribed therefor by them respectively, but such permits shall lapse, or may be cancelled, at any time when, in the opinion of said authorities, the particular exigency has passed, and no birds killed under this article shall be shipped, sold or offered for sale.

ARTICLE VIII

The High Contracting Powers agree themselves to take, or propose to their respective appropriate law-making bodies, the necessary measures for insuring the execution of the present convention.

It will be seen that the most important provision is Article II,

providing for: (1) a close season on migratory game birds from March 10th to September 1st, with the exception given; (2) an open season of three and one half months; and (3) a close season throughout the year on insectivorous birds. The open season of three and one-half months may be fixed anywhere between September 1 and March 10 to suit the local conditions. The restriction of the open season on wild-fowl to three and one-half months will involve in some provinces a shortening of the present open season, but in view of the objects of the treaty and the experience that such restriction in the United States is increasing the supply of birds, this change will undoubtedly meet with the support of sportsmen desirous of preventing the continued decrease in the numbers of wild fowl.

The conclusion of this convention constitutes the most important and far-reaching measure ever taken in the history of bird protection. Some years ago efforts were made to secure

the international protection of birds in Europe, but while the general movement towards better protection for insectivorous birds was thereby furthered, the requisite co-operation on the part of all the countries interested was hampered by inactivity on the part of some of the governments and a considerable diversity of interests and opinion. Fortunately many of these difficulties do not exist in North America, and in the United States and Canada there is an ever-growing sentiment in favour of preserving what is left of our former wealth of wild life which has been so seriously depleted by improvidence in the past. This international measure will affect over one thousand species and subspecies of birds from the Gulf of Mexico to the north pole, and we may confidently look forward to not merely a cessation of the decrease, but to an increase of our migratory birds which are so valuable a national asset.

THE POTATO EXPORT TRADE

REGULATIONS ADOPTED BY THE UNITED STATES REGARDING THE ADMISSION OF CONSIGNMENTS FROM CANADA

RELATIVE to the potato trade with Canada, on the recommendation of the Federal Horticultural Board of the Department of Agriculture at Washington, the United States Government under date of Nov. 25, 1916, decided to amend the regulations that came into effect January 1, 1916, as given in THE AGRICULTURAL GAZETTE of Canada, Vol. III, pages 6 to 9, so as to establish the following procedure in the case of importations from the Dominion:

ENTRY OF POTATOES FROM CANADA

The Invoice of Shipment of each consignment of potatoes must be accompanied by two copies of a Certificate of Soundness signed by the shipper certifying that the

potatoes are as sound as is commercially practicable, and that the shipment contains not more than ten per cent of potatoes showing traces of scab, dry rot, wilt or other potato disease, taken altogether.

STANDARDS OF SOUNDNESS

In the case of scab, all potatoes will be counted scabby which show two or more distinct scab spots. In the case of dry rot all potatoes will be counted which clearly show decay. Wilt infection will be counted when it shows as a deep internal browning at the stem end.

METHOD OF ENTRY

One copy of the shipper's Certificate of Soundness will be delivered to the Collector of Customs to be filed with the entry papers and the other will accompany the shipment to final destination. The Importer's or Broker's Report as required by Regulation

6 of the Regulations will be submitted to the Secretary of Agriculture through the Collector of Customs.

Unless the Collector of Customs shall be notified by the Federal Horticultural Board, or by one of its authorized inspectors to hold the shipment for inspection, the potatoes shall be permitted entry, so far as the jurisdiction of the Department of Agriculture is concerned, upon the receipt, by the Collector of Customs, of the Importers' or Broker's Report and the Shipper's Certificate of Soundness.

The Department of Agriculture reserves the right to reject any shipment, and to revoke existing permits or to refuse new permits as to shippers who fail to give the correct origin of their potatoes or whose potatoes are found to exceed the amount of disease stated in the Shipper's Certificate of Soundness.

PORT OF ENTRY INSPECTION

The foregoing was modified, as given below, by order of November 27, 1916, so as to permit sound Canadian potatoes to be shipped into the United States under certification by the shipper for entry at any port of entry instead of at certain designated ports, and without inspection at the port of entry, except when such inspection is specifically required by the Federal Horticultural Board or one of its authorized inspectors:

WHAT THE IMPORTER OR BROKER MUST DO

1. Make application to the Federal Horticultural Board, Washington, D.C., for a permit for the importation of potatoes as at present, designating the desired port of entry.
2. As soon as the car reaches the port of entry designated in the permit, fill out one copy of the Importer's or Broker's Report and file it, together with the Shipper's Certificate of Soundness, with the Collector of Customs.
3. If inspection has been ordered for the shipment, notify the Federal Inspector.

WHAT THE FOREIGN SHIPPER MUST DO

1. Ship only commercially sound potatoes.
2. Get the number of the Federal Horticultural Board Permit from the consignee before shipping the potatoes, so that this number may be entered on the Shipper's Certificate of Soundness.
3. Accompany the invoice of each shipment with two copies of the Shipper's Certificate of Soundness as provided in

Plant Quarantine Decision No. 12, one of which will be filed with the Collector of Customs and the other will accompany the shipment to final destination.

DUTY OF COLLECTOR OF CUSTOMS

The Collector of Customs will permit the entry of the shipment, so far as the jurisdiction of the United States Department of Agriculture is concerned, when he receives from the Importer the Shipper's Certificate of Soundness and the Broker's Report, unless he is instructed by the Federal Horticultural Board, or by one of its authorized inspectors, to hold the shipment for inspection.

WARNING

The shipper is warned that the offering for entry into the United States of potatoes not up to the standard of the Certificate of Soundness may lead not only to the rejection of the particular shipment, but also to the cancellation of existing permits and the refusal of new permits as to such shipper.

SHIPPER'S CERTIFICATE OF SOUNDNESS

The shipper by the Certificate of Soundness is required to certify that the potatoes in the shipment he is making are as sound as is commercially practicable, and that the shipment contains not more than ten per cent of potatoes showing traces of scab, dry rot, wilt or other potato disease, taken altogether, according to the following standards:

In the case of scab, all potatoes will be counted which show two or more distinct scab spots. In the case of dry rot, all potatoes will be counted which clearly show decay. Wilt infection will be counted when it shows as a deep internal browning at the stem end.

The form, which can be had from the Federal Horticultural Board at Washington, D.C., has to be made out by the shipper and forwarded with the invoice of shipment, one copy to be filed with the collector of customs at port of entry, the other to go to the consignee. Shipments may be rejected and existing permits revoked as to shippers who fail to give correct origin of their potatoes, or whose potatoes are found to exceed the permitted amount of disease.

PART I

Dominion Department of Agriculture

INFORMATION SUPPLIED BY OFFICIALS OF THE VARIOUS
BRANCHES REPRESENTED

THE DOMINION EXPERIMENTAL FARMS

THE HORTICULTURAL DIVISION

CANADIAN MAPLES TO MARK CANADIAN GRAVES IN FRANCE

BY W. T. MACOUN, DOMINION HORTICULTURIST

WHOEVER first made the suggestion that Canadian maple trees should be used to mark and beautify the ground where the bodies of Canadian soldiers lie in France deserves the

Some definite action was taken in this matter by the Horticultural Division last June on the receipt of a letter from the Assistant Director of the Royal Botanical Gardens, Kew, in which it was suggested that the



GROUP OF SILVER MAPLE (*ACER SACCHARINUM*) CENTRAL EXPERIMENTAL FARM, OTTAWA

warmest commendation. In the writer's opinion there is nothing which, in later years, will cheer the hearts of Canadians so much when visiting the battle-fields of France as to see Canadian maples growing where their dear ones were buried.

best course to follow would be to have the seed collected in Canada and sent to Kew, where the young trees would be grown, and, then when the war was over and the trees large enough, they would be sent to France from England. While it

might seem to some that the most desirable maple to use for this purpose would be the Hard or Sugar maple (*Acer saccharum*) experience has shown that this maple does not succeed very well in France, hence three other species were chosen, namely the Red or Soft maple

collected at the Experimental Farm and sent at once to Kew, where, doubtless, many hundred seedlings are already growing as, if the seed is planted soon after it is ripe, it germinates very quickly. As the Large-leaved maple is not native of any province but British Columbia,



RED MAPLE (*ACER RUBRUM*), CENTRAL EXPERIMENTAL FARM, OTTAWA

(*Acer rubrum*), the Silver or White maple (*Acer saccharinum*), and the Large-leaved maple (*Acer macrophyllum*), as it is believed that these species will do well there. Seed of the two former species, which ripens in June at Ottawa, was

seed had to be gathered there. The seed of this maple does not ripen until autumn, hence it was not possible to gather it until recently, but it has been gathered and will soon be planted at Kew.

THE RED MAPLE

The Red maple is one of the commonest maples of Eastern Canada, being found from the Atlantic Coast westward to the Rainy River. In the warmer parts of the province of Ontario it will reach a height of 100 feet or, more, making a large tree. While not as useful a tree as the Sugar maple it is quite as ornamental.

other hues which make the maple famous. Odd trees are found with these bright colours earlier in the autumn than the main body of trees, at which time they make a fine contrast with the surrounding green. The Red maple illustrating this article is growing near the Rose Garden at the Central Experimental Farm, Ottawa.



SILVER MAPLE (*ACER SACCHARINUM*), CENTRAL EXPERIMENTAL FARM, OTTAWA

In the early spring before the leaves open the scarlet blossoms, which are borne in great profusion, enliven the landscape and a little later the bright red fruit is quite attractive. It is, however, in the autumn that it shows to best advantage, when the leaves take on the bright scarlet and

THE SILVER MAPLE

The Silver or White maple is not so well distributed as the Red maple. It is rather rare east of Ontario, but is quite common in the latter province. It seems a little hardier than either the Sugar or Red maple and fairly good specimens are being

grown in Manitoba. The Silver maple is a very rapid grower and becomes as large, or larger, than the Red maple, and as a rule it makes a fine graceful tree. In Canada it is usually found along river banks and in low places when growing wild, but does well in almost any kind of soil that is not very dry. The leaves do not colour as highly as the Red maple, but there is a great variety of tints, and the leaves are more graceful than either the Hard or Red maples.

The group of Silver maples shown in the photograph is growing on the main lawn at the Central Experimental Farm, Ottawa.

THE LARGE-LEAVED MAPLE

The third species which will be grown in France is the Large-leaved maple. This is common on the lower mainland of British Columbia and on

Vancouver Island. It is noted for the great size of its leaves, especially on young trees, leaves measuring a foot in diameter not being uncommon. In favourable places it will grow one hundred or more feet in height and makes a majestic tree. It should succeed very well in France, and, as it is peculiar to British Columbia, it will, when growing with the maples from Eastern Canada, link, as it were, the East and West over our brave soldiers' graves, and be a continuous reminder of the men from all the provinces of Canada who fought and fell together in the battles of the great war, singing as, doubtless, they have often done "The Maple Leaf Forever".

The photographs illustrating this article were taken especially for the purpose, by Dr. F. T. Shutt, Assistant Director, Experimental Farms.

THE DIVISION OF APICULTURE

RECENT WORK OF THE BEE DIVISION

BY F. W. L. SLADEN, APIARIST

INVESTIGATION into the occupation of bee-keeping shows that its profitableness depends upon two principal factors; first, selection of a locality having an abundance of honey plants and a high average of suitable weather for the development of the plants and the secretion and ingathering of the nectar; second, good management of the bees.

LOCALITY

With good management of the bees, paying crops of honey can be obtained in average years from white clover (*Trifolium repens*) and alsike clover (*T. hybridum*)—in some regions chiefly white clover, in others chiefly alsike—in nearly all the farming districts in Canada, except where clover has not yet become abundant in the north and

in the drier parts of the prairie and of British Columbia. In many of the good farming sections in Southern Ontario and in certain parts of Quebec and the Maritime Provinces, the honey crop from these two plants amounts to 80 to 100 pounds per colony in average years, returning 60 to 80 per cent per annum of the capital and working expenses, labour not included. Bee-keeping yields incomes of from \$500 to \$2,500 per year to an increasing number of specialists.

There are, however, a number of little known localities where other important honey plants occur, about which it seems very desirable to obtain further information, particularly as it is probable that some of these localities exceed in productiveness the best clover districts on account of the fact that the plants

referred to flower later in the season than clover and so extend the honey-gathering season over a longer period. The longer season of possible honey flow may be expected not only to increase, but to steady the annual yield, reducing the frequency of seasons of failure because of the dependence of honey production upon weather, it being the general experience that weather of a

ing or fire has recently passed, and in the clay belt of Northern Ontario, also on the Pacific coast and at an altitude of between 3,000 and 4,500 feet in the Rocky Mountains. It yields from early July to the end of August, and the honey is white and mild flavoured.

Second in importance to fireweed are certain species of golden-rod and aster found growing together in abundance in certain places, and yielding a rich flavoured amber-coloured or white honey in August and in many places until the middle of September.

Some of the most promising locations containing these plants are in districts that are now only beginning to be settled, and for many years to come will be capable of yielding large and very profitable crops of honey before much land can be brought under cultivation. The principal object of my tour of the provinces during the summer of 1916 was to study some of these areas with the intention of starting a co-operative experiment with an enlightened bee-keeper practising modern methods, if one could be found, in each region that seemed promising enough to demand further investigation.

THE MOST IMPORTANT REGIONS

The following are some of the most important regions visited:

The railway from North Bay to Cochrane passes through a very promising country for honey production. A good sized apiary conducted on modern lines exists at Haileybury and another at Thornloe, and both are giving good profits. At the latter place Mr. William Agar reports an average of 233 pounds of honey extracted per colony, spring count, in his apiary in 1916, and a colony on scales gained 480 pounds. The honey crop in this region comes principally from alsike and white clover (end of June to about the end of July), and from fireweed (beginning of July to end of August).



FIREWEED—*EPILOBIUM ANGUSTIFOLIUM*

certain type often prevails for a considerable time before a change takes place.

Probably the most valuable of these plants is the fireweed (*Epilobium angustifolium*) which is found in partly cleared timber lands, and is especially abundant in rich, moist clearings where the timber is decay-

Moist, partly-cleared timber and scrub areas east of Winnipeg, including the environs of Beausejour, Molson and Whitemouth. The principal sources of honey here are white clover, fireweed, golden-rods and asters, giving a possible duration of honey flow from the end of June to the beginning of September. At Beausejour, tons of honey are being produced by the Polish settlers by old-fashioned methods, in hives made on the pattern of those formerly used by them in Europe.

Partly-cleared timber and scrub lands in northern Saskatchewan between Tisdale and Prince Albert and the surrounding country. The honey gathering season here is evidently not a long one, but the district needs further investigation because paying crops of honey have been obtained at Melfort by Mr. George Weaver, a pioneer bee-keeper, and very little is known about the plants from which the honey is gathered. The principal honey plants appear to be the anise hyssop (*Agastache foeniculum*), the wolfberry (*Symphoricarpos occidentalis*), *Hedysarum boreale*, a plant closely related to sainfoin and fireweed. These plants are plentiful in the scrub and timber lands of large sections of the prairie, principally to the north.

In the alfalfa growing districts in Southern Alberta, an average of about 100 pounds per colony, principally from alfalfa, has been obtained at the Dominion Experimental Farm at Lethbridge during the past three years. The work of the bees is somewhat hampered by high winds, and this year the crop was smaller on account of much unfavourable weather. The region of the profitable production of alfalfa honey probably extends into the dry belt of British Columbia.

Most of the prairie honey plants yield better in a wet season than a dry one, alfalfa being apparently an exception, and the timber and scrub

lands are more productive than the bare prairie.

Regions in the Maritime Provinces, mainly near the coast, containing an abundance of the abundant honey producing species of golden-rod and aster. The best known of these districts is in Charlotte county, N.B., but the golden-rods and asters found here are equally abundant in



SOLIDAGO SQUARROSA
One of the best Species of Golden-Rod for Honey
Production

spots in the vicinity of Bathurst and Moncton. At Honeydale in Charlotte county a long-established apiary was visited in which the principal honey flow of the season comes from these golden-rods and asters in August and September, the best places for their growth being swamps and bogs that have been partly drained and burned over, and also sandy barrens. The most pro-

ductive species of golden-rod and aster were found to be *Solidago uliginosa*, *S. puberula*, *S. rugosa* and *S. graminifolia*, and *Aster umbellatus* and *A. puniceus*. A sample of the August gathered honey at Honeydale was found to be of a bright yellow colour and had an exquisite aroma and flavour which will possibly give it a reputation something like that enjoyed by Scotch heather honey, when it becomes better known.

The Gatineau valley is a very good bee-keeping section more or less typical, no doubt, of the watersheds of several northern tributaries of the Ottawa and St. Lawrence rivers. For a distance of forty or fifty miles up the Gatineau river clover is the principal source of honey. Farther north clover becomes less valuable, but fireweed grows very important, and golden-rods and asters are of value in many places. Places can be selected where all these plants are present in abundance, giving a possible continuous flow of about twelve weeks from the end of June to the middle of September. Two colonies of bees from the Experimental Farm, Ottawa, placed in a golden-rod district of the sandy barren type at Kazubazua, Que., about 50 miles up the Gatineau river, for the summer of 1916 gave 241½ pounds and 280¼ pounds of surplus honey respectively. Of this honey an average of 60 pounds per colony was obtained from blueberry at the end of May, an average of 132 pounds per colony principally from clover, in June and July, and an average of 61 pounds per colony from two species of golden-rod, *Solidago squarrosa* and *S. puberula*, in August. Dry weather in August with the absence of any lengthened period of fine weather in early September made the golden-rod flow less than it would be in average years. Another colony placed at Sully, Que., a locality of swamps, three miles from Kazubazua, gave 220 pounds for the season, consisting

of 34 pounds of blueberry honey, 132 pounds of principally clover honey and 54 pounds of golden-rod and aster honey gathered in August and September. Some of the golden-rod honey gathered at Kazubazua was spoiled by fruit juice gathered from over-ripe blueberries. At Montcerf, Que., about 100 miles up the Gatineau, a large apiary is kept by the Martineau Brothers, in which the average annual yield for the past seven years has been 130 pounds per colony, principally from fireweed.

EXPERIMENTS

A co-operative experiment has been carried on with the Martineau Brothers at their Montcerf apiary, and also at an apiary they have recently started in a choice location six miles farther north in the township of Lytton. The experiment is on the lines of those that we are carrying on at all the Branch Experimental Farms where bees are kept, and consists of keeping a colony of ascertained strength on scales throughout the season and noting the daily gain and loss in weight, together with information about the daily weather, the plants the bees are working upon, the quality of the honey produced at different seasons, the yield per colony, spring count, and tests of methods of management adapted to the local conditions. Information obtained in this way from large apiaries situated in selected locations supplied by observant specialist bee-keepers forms so valuable a supplement to our bee investigation work at the Branch Experimental Farms that steps are being taken to extend this co-operative work.

The great variations in honey yield from season to season, caused chiefly by variations in weather, show that reliable figures of the productiveness of any locality can only be obtained by averaging the results of a number of years. These figures, however, will be of great

value to those who, having learned how to keep bees successfully (proficiency cannot be attained in less than two years), wish to settle in districts yielding the largest profits, and they will also warrant the special encouragement of bee-keeping in such districts.

On account of the small amount of capital required and the healthy outdoor life, bee-keeping is one of the suitable occupations for returned and disabled soldiers after they have been trained.

bee management in Canada, wintering and swarm control, are being specially studied at the Central Experimental Farm at Ottawa. Investigations into wintering have shown that a heavy loss of bees has occurred during the past two winters in many bee cellars in the Ottawa district. This loss has been traced to unwholesome and granulated stores combined with excessive dryness in many cellars. In order to discover the source, or sources, of the unwholesome honey, colonies are



APICULTURAL BUILDING, CENTRAL EXPERIMENTAL FARM,

Adjoining the apiary at the Central Experimental Farm is a honey-plant garden, where the principal honey-plants of the country are being grown in order that the effect of soil and weather on their productiveness may be studied. Collections of typical honeys from different localities, and of dried specimens of all the Canadian species of honey-plants, are also being made.

MANAGEMENT

The two principal problems in

being wintered on stores gathered during three different periods of the honey flow. To study the effect of varying degrees of humidity on bees wintered on these different stores, some of the colonies will be kept in a dry cellar and others in a moist one in the new Apicultural building that was erected last year at the Central Experimental Farm, the amount of relative humidity in each case being noted. Following a method adopted with success at the end of last winter, each colony is

being supplied with an empty shallow chamber between the brood chamber and the floor, and paper trays are to be slipped in over the floor and removed at fixed intervals to ascertain the rate of mortality of the bees. By making daily observations on the rate of mortality last winter in this way, it was definitely ascertained that the supplying of water to the bees in the cellar reduced the mortality.

The problem of swarm control has been attacked in two ways, - by

endeavouring to breed a non-swarmling bee and by manipulation. The former method has had to be abandoned temporarily on account of more pressing work likely to give results sooner. Experiments in manipulation methods were carried on in the apiary of the Central Experimental Farm during 1916, and the experience gained and information gleaned will be put to good use in further experiments that are to be conducted next summer.

THE ENTOMOLOGICAL BRANCH

THE FUMIGATION AND INSPECTION OF IMPORTED NURSERY STOCK UNDER FEDERAL LEGISLATION

BY ARTHUR GIBSON, CHIEF ASSISTANT ENTOMOLOGIST

INTRODUCTORY

THE Entomological Branch of the Dominion Department of Agriculture, not only assists farmers, fruit growers, market gardeners, and others, in controlling the many kinds of destructive insects which attack growing crops, stored crops, garden and greenhouse plants, domestic live stock and man himself, but it is also actively concerned in protecting the various provinces of Canada from injurious insects which are liable to be introduced from foreign countries through the ordinary channels of commerce, or by other means. Some of our worst insect pests were introduced, years ago, from Europe and other countries. To guard against the introduction of certain kinds which are known to be seriously destructive to plants, and to take such action as is deemed necessary regarding the control of dangerous pests already within Canada, legislation was enacted.

EARLY WORK UNDER THE SAN JOSÉ SCALE ACT

The San José scale on its appearance in the Eastern United States, in injurious numbers in 1893, caused widespread anxiety not only among fruit growers in the Eastern States, but also among owners of orchards in Canada, particularly in the province of Ontario where peaches are extensively grown. Early in 1897, the first undoubted specimens of the San José scale occurring in Ontario, were received by the Dominion Department of Agriculture. The question of protection, therefore, to prevent the further introduction into Canada of this pernicious insect was at once considered, and as a result the San José Scale Act was passed by Parliament on March 18, 1898. Under this Act the importation of nursery stock into Canada (excepting greenhouse grown plants; herbaceous perennials, herbaceous bedding plants, conifers, bulbs and tubers) from the United States of America, Australia, Japan and the Hawaiian Islands, countries in which the San José scale occurred, was prohibited.

In the passing of the Act, every effort was made both by the Federal Government and the Provincial Government of Ontario, to detect any occurrences of the scale insect, a thorough inspection being made of that section of the province of Ontario in which the insect was found in 1897. Under "An Act to Amend the San José Scale Act" passed in January, 1901, importations of nursery stock from countries where the San José scale was known to exist, were allowed to enter Canada, during certain seasons, through specified customs ports, where they were fumigated with hydrocyanic acid gas in specially prepared chambers.

THE DESTRUCTIVE INSECT AND PEST ACT

The San José Scale Act, as will be seen, concerned itself with one insect only and beyond the fumigation of shipments of imported nursery stock at certain customs ports of entry, the Dominion Government had no power of preventing the introduction into the various provinces of other injurious insects or the spreading within Canada of destructive forms already present.

The first federal inspection of imported nursery stock took place in 1909, during the months of January to May. This was urgent owing to information received from the Chief of the Bureau of Horticulture of the State of New York to the effect that nests of the brown-tail moth were being discovered, in that State, in French shipments of nursery stock destined to America. In that year, the nurserymen of the provinces of Ontario and Quebec gladly co-operated with the Federal Department of Agriculture in permitting its officers to examine shipments of nursery stock from France and Holland. Such inspection proved to be of the utmost importance in view of the fact that no less than 196 nests of the brown-tail moth were

discovered on nursery stock imported from badly infested nurseries in France. Provincial Department of Agriculture officials in provinces other than Ontario and Quebec were promptly advised of our findings so that every precaution could be taken to prevent the establishment of this dreaded pest through such importations.

The finding of the nests of the brown-tail moth in shipments of nursery stock from France hastened the passing of further legislation under which the Dominion Government would have the power to inspect or otherwise deal with importations of nursery stock and also to take such action as was deemed advisable to prevent the spreading within Canada of any pests considered dangerous. In May, 1910, therefore, the Dominion Parliament passed "An Act to Prevent the Introduction or Spreading of Insects, Pests and Diseases Destructive to Vegetation," which Act was cited as The Destructive Insect and Pest Act. In the passing of this Act, the San José Scale Act of 1908 was repealed.

Under the regulations of the Destructive Insect and Pest Act, nursery stock, including all trees, shrubs, plants, vines, grafts, scions, cuttings or buds, excepting greenhouse-grown plants, herbaceous perennials, (the stems of which die down in winter), herbaceous bedding plants, bulbs and tubers, and cottonwood or necklace poplar when shipped from and grown in Dakota or Minnesota, shall be imported only during certain periods and customs ports, as follows:

Vancouver, B.C., from October 1st to May 1st.

Niagara Falls, Ont., from October 1st to May 15th.

Winnipeg, Man., North Portal, Sask., and St. John, N.B., from March 15th to May 15th and from October 7th to December 7th.

Truro, N.S., and Digby, N.S., for nursery stock destined to points in the province of Nova Scotia only, from March 15th to May 15th and from October 7th to December 7th.

Windsor, Ont., and St. Johns, Que., from March 15th to May 15th and from September 26th to December 7th.

At these ports of entry all importa-

provided for that purpose. Nursery stock grown in Japan or in any one of the States of Vermont, New Hampshire, Maine, Massachusetts, Con-



NEW FUMIGATION AND INSPECTION STATION, NIAGARA FALLS (MONTROSE STATION), ONTARIO

(From Report of the Dominion Entomologist for the Year Ending March 31st, 1915)

tions excepting those originating in Europe (and certain classes of nursery stock which are exempt) are fumigated in the fumigation houses

necticut and Rhode Island after fumigation, is also subject to inspection. European (including British) nursery stock is exempt from fumi-

gation but is inspected either at the port of entry or at destination. In addition to the above ports of entry, stock originating in Europe may enter at the ports of Halifax, N.S., Sherbrooke, Que., and Montreal, Que., from September 15 to May 15. Such European stock may also enter at the port of St. John, N.B., during the same period.

In addition to the fumigation and inspection of imported nursery stock, the Act also empowers an inspector appointed thereunder to enter any lands, nursery, or other premises in Canada, where there is reason to believe any of the insects scheduled in the Regulations are or may be present and to give instructions for the treatment or destruction of any tree or other vegetation or vegetable matter, or the containers thereof, which may be found or suspected to be infested.

The Act also prohibits the sale of any vegetable matter infested with any of the insects specified in the Regulations.

PROHIBITED IMPORTATIONS

Certain classes of nursery stock or plant products liable to introduce dangerous insect pests are prohibited, under the Regulations of the Destructive Insect and Pest Act, from entering Canada, owing chiefly to the practical impossibility of properly inspecting the same.

These are:

(a) Coniferous trees, such as spruce, fir, hemlock, pine, juniper (cedar) and arbovitæ (white cedar) or foliage thereof, and decorative plants, such as holly and laurel, from the states of Maine, Massachusetts, New Hampshire, Connecticut and Rhode Island;

(b) Plants, portions of plants and non-canned fruits, or other vegetation from the Hawaiian Islands;

(c) Potatoes from the state of California;

(d) The importation of nursery stock, except certain classes of florists' stock duly certified, through the mails is prohibited.

The destructive insects to which the Act applies are the following:

The San José Scale, *Aspidiotus perniciosus*,

The Brown-tail Moth, *Euproctis chrysorrhoea*,

The Woolly Aphis, *Schizoneura lanigera*.

The West Indian Peach Scale, *Aulacaspis pentagona*.

The Gipsy Moth, *Porthretria dispar*.

The Mediterranean Fruit Fly, *Ceratitis capitata*.

The Potato Tuber Moth, *Phthorimaea operculella*.

Nursery stock or vegetable matter infested with any of the above pests is prohibited and if imported in contravention to the Regulations of the Act will be either exported or destroyed.

REQUIREMENTS GOVERNING IMPORTATIONS

Consignors of shipments of nursery stock are required to indicate clearly on each package the name of the port by which it is intended that the nursery stock shall enter Canada.

All persons, except residents in British Columbia, importing nursery stock subject to inspection are required to notify the Dominion Entomologist within five days of despatching the order for the same, such notice to include a detailed statement of the nature, quantity and the points of origin and destination of the stock, the name of the consignor and the consignee and the name of the transportation company or companies carrying the stock. The importer is also required to send a second notice to the Dominion Entomologist immediately the shipment arrives at its final destination. Notice shall also be given by all transportation companies, custom house brokers, and other persons, importing or bringing into Canada nursery stock that is subject to inspection, immediately such consignment is received by them.

European and such other nursery stock subject to inspection must not be unpacked except in the presence of an inspector.

Forest plant products, including

logs, tan bark, posts, poles, railroad ties, cordwood and lumber originating in anyone of the states of Maine, Massachusetts, New Hampshire, Connecticut, and Rhode Island are not allowed entrance into Canada unless accompanied by a certificate showing that they have been inspected by the United States Department of Agriculture and found free from the gipsy moth.

THE FEDERAL FUMIGATION OF IMPORTED NURSERY STOCK

As mentioned above, imported nursery stock (excepting European grown and certain other classes) is subject to fumigation on entering Canada. At each port of entry a fumigation station has been provided on the railway, to which station the transportation company carries the shipments. The fumigating houses, or chambers, vary somewhat in size according to the needs of the station, but all are sufficiently large to enable the resident officer in charge to handle and fumigate all consignments promptly on arrival. The shipments of nursery stock are carefully removed to the fumigating chamber and there submitted for a period of 45 minutes to hydrocyanic acid gas. Nursery stock thus treated originates in countries where the San José scale is known to exist. The object of the fumigation, of course, is to kill such small insects as the scale insects, etc., which pests it would be difficult to detect by inspection. When the nursery stock is placed in the chamber the amount of chemicals (water, commercial sulphuric acid and potassium or sodium cyanide) necessary to generate the required strength of gas, is placed into an earthenware crock, and the doors of the air-tight chamber quickly closed for the period of exposure. The required amounts of acid and cyanide are delivered in sealed bottles, to our Superintendents of Fumigation, to obviate any delay in fumigation or irregularity of the formula.

When a shipment of nursery stock has been fumigated the Superintendent of Fumigation issues a certificate of fumigation. Without such certificate the Customs' officers do not allow any stock to be taken out of bond.

METHOD OF INSPECTION

The method of inspecting nursery stock which is allowed to proceed to destination is as follows: Under Regulation IV of the Destructive Insect and Pest Act, the stock of such shipments, however, must not be unpacked except in the presence of an inspector. This means, of course, that the plants are removed by the owner of the consignment, or his help, and handed to the inspector who carefully examines them individually and if free of any of the insects scheduled in the Regulations they are returned to the owner for such disposition as he requires them, and a certificate of inspection is issued. If any of the plants in the shipment are found to be infested they are placed on one side to be destroyed immediately the inspection is over. In the case of large shipments of apple and other fruit seedlings, many of the nurserymen arrange for the inspection of such plants in a cool building where sufficient table space is available. Under such conditions the seedlings are rapidly placed on to the table, passed to the inspector, who in turn hands them to a second helper for removal. With such help it is possible to inspect large shipments very quickly and to the entire satisfaction of the nurserymen.

In the case of shipments of nursery stock which are inspected at the port of entry, these consist largely of packets containing only a small number of plants. They are inspected promptly on arrival by our resident inspector and at once carefully repacked for immediate furtherance to destination accompanied by the necessary certificate of inspection.

In the Province of British Columbia all such inspection work is carried on in Vancouver by provincial authorities under the supervision of the Dominion Entomologist who is represented locally by an officer of the Dominion Entomological Branch. With the Province of Nova Scotia an arrangement has also been entered into under which, when necessary, examination of nursery stock subject to inspection under Dominion Regulations may be made at Truro, N.S., and Digby, N.S., by provincial officers.

On the completion of an inspection, an inspection certificate is issued which is duly signed by the inspector making the examination.

With the coming into force of the Destructive Insect and Pest Act qualified inspectors were appointed to carry out the Regulations of the Act, and ever since the date of such Act (1910), all imported nursery stock, subject to inspection, to no matter what point in Canada, has been carefully examined.

It is most gratifying to be able to state that nurserymen and others, throughout Canada, have at all times given every assistance to our inspectors thus enabling them to carry out quickly their important duties. No one more than the nurseryman himself, realizes the value of having clean stock for sale and the establishment of such dreaded pests as the brown-tail moth and the gipsy moth in his nursery is by no means desired. Since the passing of the Act necessitating the inspection of certain foreign nursery stock, our inspectors have proved the wisdom of the enactment of such Act, not only by discovering nursery stock infested with the brown-tail moth, but also in finding in importations the egg masses of the gipsy moth. Such infested stock, of course, was promptly destroyed by burning, as well also

as all packing and even the wooden cases in which the plants had been shipped. In addition too, shipments of fruit infested with the San José scale have been detected by our inspectors and refused admittance into Canada.

INSPECTION OF NURSERY STOCK EXPORTED TO THE UNITED STATES

Under the Rules and Regulations of the United States Plant Quarantine Act no nursery stock from Canada is allowed entry into the United States unless the same is accompanied by a certificate of inspection issued by the Entomological Branch of the Dominion Department of Agriculture. Such certificates are issued in duplicate and styled "original" and "copy". The certificates indicate the date of the inspection of the nursery stock, the name of the grower, the district where grown, and the name of the inspector. Each certificate bears the seal of the Branch and is issued under the signature of either the Dominion Entomologist or the Chief Assistant Entomologist. The original certificate accompanies the invoice or other papers covering the shipment and the copy certificate is attached to the container. When a shipment consists of more than one container additional copy certificates are issued.

EXTENT OF IMPORTATIONS

From the records of all inspections of nursery stock on file in the Entomological Branch, the following table indicates the extent of the importations which were subject to inspection. The total number of trees, shrubs, etc., is given for the importation seasons which have already been indicated. Such figures covering all importations to Canada were, of course, available with the coming into force of the Regulations of the Destructive Insect and Pest Act.

Importation seasons of	Number of plants inspected
1909-1910	2,500,000*
1910-1911	4,044,313
1911-1912	3,800,000
1912-1913	4,065,827
1913-1914	4,843,358
1914-1915	2,336,558†
1915-1916	2,403,303†

In the year 1909, (January to May) 1,503,129 plants, destined to importers in the provinces of Ontario and Quebec, were inspected.

* Exclusive of stock imported into British Columbia.

† The decrease in the number of plants subject to inspection, imported during the importation seasons of 1914-1915 and 1915-1916, is, of course, due to the war.

As to the number of trees, shrubs, etc., which are imported from the United States and other countries the stock grown in which is subject only to fumigation no definite records are available. An approximate record, however, has been kept of such shipments. The quantity of nursery stock fumigated far exceeds of course, the quantity inspected. Between sixty and seventy per cent of the nursery stock imported into Canada originates in the United States of which only that grown in the states of Vermont, New Hampshire, Maine, Massachusetts, Connecticut and Rhode Island is subject to inspection.

THE FRUIT BRANCH

THE SALE OF CANADIAN APPLES IN GREAT BRITAIN

BY F. H. GRINDLEY, B.S.A., ASSISTANT TO THE COMMISSIONER

THERE are many producers and exporters of Canadian apples who are not familiar with the method of fruit transportation to Great Britain or the manner in which the fruit is handled and sold on arrival there. The subject is one of great interest and, if covered in all its details, would occupy much space. This article will, however, deal particularly with the handling of fruit in Great Britain and only slightly with the Canadian end. Much of the matter presented has been gathered from the reports of Mr. J. Forsyth Smith, Canadian Fruit Trade Commissioner at Manchester, Eng., who has sent to the Department of Trade and Commerce at Ottawa most valuable information on this subject.

INSPECTION AT SHIPPING POINT

Since 1914 the inspection of Canadian apples (in Canada) destined for Great Britain, has been largely done at the shipping point rather than on the docks at the points of export;

the reason for that is (1) that it allows the inspector to assist the packer in his orchard by showing him just what class of fruit shall be packed under each grade, and (2) that cases of violation are noted *before* the fruit is shipped and, consequently, the packer is able to see for himself wherein he is wrong. Of course there are also one or two inspectors at the points of export whose duty it is to examine a portion of any packages that have not already been inspected.

The cars are run into the dock sheds and unloaded there. The barrels are then lowered into the ship's hold, six at a time, by means of a derrick and sling. This has been found to be the most satisfactory method of loading. The only opportunity which the inspectors have to examine the fruit is during the short time when the barrels are being moved from the cars to the vessel. This difficulty is, however, largely overcome by the very thorough system of inspection at the shipping point.

SOLD BY AUCTION

By far the largest quantity of Canadian apples is sold in England by auction. This method ensures rapid distribution, and the keen competition results in high prices for packs which are known to be reliable. The only objections are (1) that the fruit is sometimes sold too rapidly to secure the highest prices and, (2) that brokers will sometimes hold

are apt to order more fruit than they can dispose of to advantage.

Very little direct shipping on an f.o.b. basis has been done. An investigation is now being made, covering this method of sale, and results will be available later.

Good results have attended the placing of a "Sales Representative" in Great Britain, who is able to look after all the interests of the shipper,



CANADIAN FRUIT BEING SOLD BY AUCTION IN GREAT BRITAIN

fruit over on the chance of securing higher prices later. Neither of these objections is serious.

The consigning of fruit to reliable houses is satisfactory, but in the large distributing centres the prices are in many instances regulated by the auction sale; and if fruit is shipped to the smaller receiving points there is often a danger of overstocking such markets. This is because the wholesalers at these points

and dispose of the fruit in any manner he thinks best. This method would, however, only be practicable where a large tonnage is concerned.

METHOD OF SALE

The following extract from a report by J. Forsyth Smith gives a very clear account of the method in which apples are sold by auction in the English markets:—

"The apples are received on the quay as they are discharged, by a quay foreman in the employ of the broker, who sees that they are classified in lots according to mark and grade and also according to condition as tight, slack, slightly wet, or wet. On the report of this employee, checked as occasion seems to warrant by personal inspection by the broker, the apples are entered on printed catalogues as classified, the catalogues clearly indicating the origin of the fruit (Nova Scotia, Ontario, Virginia, Maine, etc.), the steamer on which it has arrived, the name of the packer or shipper, the number of barrels or boxes in each lot, and the judgment of the broker's representative as to their condition. The apples are arranged in order on the quay and, at some time before the sale, the larger buyers make a practice of sending down representatives who examine the various lots and make detailed note of the pack, colour, grade and quality of each, which they report to their employers. Buyers who cannot afford to have such a detailed inspection made by their own employees, avail themselves of a similar report that is made and distributed to them by one of the master carters of the city. As a result of this system when a buyer bids at the sale, he has in mind in making his offers, not only the information furnished by the brokers on the catalogues, but also the judgment of his own employees as to the relative value of the various lots. A premium is thus placed upon good pack and grade and, while poor lots may be quite neglected, good ones have the benefit of an eager competition that brings top prices.

"Some 200 to 250 buyers assemble in the commercial salesroom, where the seating is arranged in successive tiers as at a theatre. These buyers comprise wholesalers from Liverpool and also from all considerable towns and cities in the north and middle of England. The auction is closed except to those who are specially admitted by license, and wholesalers who are not members must do their buying through a member who charges a commission of 3d. to 6d. a barrel for his services. In the centre of the room there is a trap-door communicating with a basement beneath and as each lot is offered for sale a sample barrel or box, opened, is sent up from below for inspection. As the buyers do not leave their seats, this inspection must necessarily be made at long range and is only regarded as a supplementary to the more detailed inspection at the quay. Quite frequently, however, some 20 to 30 apples are thrown to buyers who wish to examine them more closely and if there is any doubt as to the condition of the fruit, the whole barrel is emptied out and exposed to view in large baskets provided for the purpose. After this demonstration of value, the bidding begins and the lots,

usually 20's or 30's, are knocked down to the highest bidder.

"Each of the six members of the Liverpool Fruit Brokers' Association, Limited, takes his place on the rostrum for a definite period and offers the fruit that has been placed in his hands to the same buyers. At the end of this period he must give way to his successor, and if he still has anything to offer he waits till his turn comes round again. The rotation is arranged so that the first turn is given to a different broker each day.

"The buyer has the right of rejecting for cause within 48 hours of purchase. If he has bought 'tights' and is offered 'slacks' at the quay, or if the sample shown at the sale was very manifestly superior to the apples delivered, rejection is in order. As a matter of fact, rejection for any other reason than mis-classification is rare. Rejected apples are re-catalogued and re-sold at a subsequent sale. Occasionally, instead of accepting a rejection, the broker may arrange to compromise on the price offered at the sale. As this, however, would encourage haggling, it is seldom done.

"In Liverpool auction sales are held regularly every Monday, Wednesday and Friday throughout the season and the sales are usually largely attended and marked by active competition.

"In Manchester the sales are held regularly every Tuesday and Thursday throughout the season. All the arrangements are quite similar to those in effect in Liverpool. This auction is also a closed one and is attended by many of the buyers who attend the Liverpool sale.

"In Glasgow there are two auction sales, and sales are held with fair regularity twice a week throughout the season usually on Wednesdays and Fridays. The Glasgow sales are not closed, but open to all who care to attend, retailers as well as wholesalers. Even the street hawkers or barrow women take part in them, though the fact that most of the apples are sold in lots of 20 or 30 or more naturally restricts the operation of the small dealers, who buy principally samples or broken and rejected lots and the small parcels occasionally offered. As in Liverpool, the apples are classified on the quay by brokers' employees. Here, also, the large buyers arrange to have a report upon the condition and quality of each lot before entering the salesroom; but the practice is not so general as in Liverpool. Samples are also displayed at the auction as each lot is offered. The same rules are also effective as to rejections, and there is similar co-operation among the brokers to sell in turn to the same roomful of buyers.

"In London the auction sales arrangements are by no means as good as at the other centres. The brokers do much of the

selling by private treaty, the auction sales are held irregularly, and the most important difference of all, there is no co-operation of the brokers with sales from a single rostrum. Each broker holds forth at his own stand and several sales may be going on at the same time, with the buyers divided among them all. There is a similar lack of system in the methods of

classifying the apples, the catalogues in some cases not giving even the marks which are considered of much importance at other auction centres as indications of value. The buyers simply base their bidding on the samples displayed at the auction. The sales are open and may be attended by anyone."

THE LIVE STOCK BRANCH

PRIZES FOR WOOL IN THE FLEECE AT CANADIAN FAIRS

BY T. REG. ARKELL, B.S.A., B.Sc., IN CHARGE OF SHEEP DIVISION

PRIZES for wool in the fleece represent an innovation established, at the instance of the Minister of Agriculture through the medium of the Live Stock Branch, by many Canadian Fairs this year. A greater number of fleeces were entered in most instances than it was expected the first year would bring forth, and the interest the exhibits aroused upon display augurs well for a substantial increase in the number of entries in this class next year. Secretaries of Fairs offering prizes were satisfied with the showing this department made, so much so that not only is a continuance assured but other exhibitions have proposed introducing a similar classification in their prize lists.

Most of the Eastern Fairs had the prizes divided into three sections, Fine Medium, Medium and Coarse, but two exhibitions, Ottawa and Three Rivers, included Lustre as well, which makes the classification very complete, covering all types of domestic wool produced to any degree. In the Prairie Provinces four classes were provided, two for Range or Merino, Fine and Medium, and two for Domestic, Medium and Coarse. Four, five, and in some instances as many as seven awards were given. Sheep-raisers alone were permitted to compete, manufacturers and dealers being excluded. The number and character of the entries at the different fairs are included in the table.

NAME OF FAIR	ENTRIES			
	Fine Medium	Medium	Coarse	Lustre
Canadian National, Toronto	7	16	8	
Central Canada, Ottawa	12	16	4	4
Western Fair, London	6	4	4	
Orms town	10	13	8	
Quebec Provincial Fair, Quebec	6	22	8	
Great Eastern Exhibition, Sherbrooke	8	20	7	
Three Rivers	4	20	3	3
Valleyfield	2	10	6	
Nova Scotia Provincial, Halifax	.....	2	.....
P.E.I. Agricultural & Industrial, Charlottetown	3	8	4	
Vancouver	3	4	3	

NAME OF FAIR	ENTRIES			
	Range Fine	Range Medium	Domestic Medium	Domestic Coarse
Provincial Exhibition of Manitoba, Brandon	.	12	12	8
Calgary Industrial Exhibition	3	2	3	3
Edmonton	.	6	11	2
Provincial Exhibition, Regina	3	4	17	11
Saskatoon Industrial Exhibition	4	3	15	9

The fleeces were judged in accordance with the following standard:

SCORE CARD OR SCALE OF POINTS FOR JUDGING FLEECES OF WOOL

	Scale of Points	Scale of Fleece
Shrinkage	22	
Preparation (rolling, tying and absence of foreign material)	15	
Uniformity (percentage of sorts, trueness and evenness)	12	
Density (size of fleece)	10	
Tensile strength	9	
Length	8	
Diameter (fineness of fibre)	7	
Lustre or brightness (colour)	6	
Crimp and elasticity	6	
Softness	5	
Total	100	

Presence of sisal fibres, dung locks and paint will act as a complete disqualification.

THE WOOL EXHIBIT

Greater interest attended the presentation of the wool exhibit than in any previous year. Consequently, its itinerary was extended and it was displayed at a greater number of fairs. It has already this year been shown at 31 fairs from Vancouver to Halifax, and was visited by more than a million people. During that time 84,900 copies of pamphlets upon the sheep and wool husbandry were distributed to people distinctly interested in the pursuit of this phase of the live stock industry.

Many new features this year were added to the exhibit. A very complete display of Karakule wool

and Persian Lamb skins produced in Canada acted as an educational attraction, together with sheepskins, pulled wool, slats and their manufactured articles. Products of the home woolen industries of Canada were exhibited in an effort not only to introduce them to the consuming public, but to create a more widely spread interest in the development of work of this character by women in the homes. Demonstrations, showing the most approved methods of preparing wool for market and in grading and sorting, were given at every Fair. At the Canadian National Exhibition, Toronto, a special educational feature was staged, in connection with the display of home-spun woolen fabrics, showing the process of manufacture from wool to yarn and cloth as spun and woven by hand.

THE SEED BRANCH

SEED POTATOES FOR 1917

BY G. LE LACHEUR, B.S.A.

LAST year the total potato yield in Canada was over 23 million bushels short of the 1914 crop, and $12\frac{1}{2}$ million bushels short of the previous five-year average. The shortage occurred principally in the Maritime Provinces and Ontario, the yield being larger in Alberta and British Columbia. Potato diseases were very severe in the Maritime Provinces in 1915, but the crop has recovered this year with a good yield. Climatic conditions were very unfavourable in Ontario last year and again during the past season, with its extreme heat and drought following a heavy rainfall up to July. Ontario alone was in 1915 over $5\frac{1}{2}$ million bushels short of the previous five-year average, its low average yield per acre having decreased 35.43 bushels. The 1916 yield is much lower.

The past two seasons in Ontario are comparable to those of 1906 and 1907, at the Central Experimental Farm, when Mr. W. T. Macoun reports rapid decreases in potato yields which were continued and resulted practically in deterioration during 1908 and 1909. Four varieties, each of which yielded over 300 bushels per acre as an average for the four years ending 1905, had dropped to an average yield of less than 49 bushels per acre by 1909. Mr. Macoun attributes part of the marked falling off in yield during 1907 and 1908 to the weakened vitality of the seed, which operated yet more strongly during 1909, even though the season was more favourable.

NORTHERN-GROWN SEED IN DEMAND

Seed brought from the Nappan,

N.S., crop of 1906, gave almost twice as great an average yield in 1907 as from the home-grown seed of the same sorts. In 1908 the best seed from the Nappan stock of the year before, as compared with the best seed of the home-grown stock, showed an average increase from six varieties of 133 bushels per acre in favour of the Nappan seed. New Nappan seed was obtained for the 1909 crop and gave a higher yield than that introduced two years previously. Seed obtained from Indian Head, Sask., gave results in 1910, in comparison with Ottawa seed, which show that a change of seed sometimes more than doubles the yield of potatoes.

While Dr. Zavitz reports a slight increase in potatoes grown at Guelph for 26 years, he found that seed potatoes from Muskoka gave higher yields than seed obtained from any other source, and states that the superior value of Northern grown seed is probably due to the fact that they are produced in a cool, short season, and are harvested before they are fully matured. Similar results have been obtained in the south of England from seed potatoes grown in the cooler, moister climates of Scotland and Ireland. Indeed it has become common practice for the Southern States to obtain seed potatoes from Maine, and for Bermuda to obtain seed from Nova Scotia. The prematurely ripened potato of the hot dry climates appears to degenerate rapidly as seed.

The special need for Northern-grown seed potatoes for Ontario this season may be met by obtaining good healthy stocks of suitable vari-

eties from parts of Eastern Quebec and New Brunswick. Only a few car lots are available from Northern Ontario. Some stocks may be located through the inspection reports of the field crop competitions conducted by the Provincial departments.

The Division of Botany of the Experimental Farms Branch, through its field inspection reports, can recommend the crops of certain growers in regard to freedom from disease, and this might be supplemented by inspection of seed potatoes for shipment. At the present time

Canadian potatoes free from injurious potato diseases and insect pests, may be admitted to the United States, but there are no restrictions on shipment to other points in Canada. Contract prices might be based on the Montreal and Toronto quotations during the week of delivery. Large quantities of potatoes suitable for seed have been stored in New Brunswick this autumn, and the necessary steps should be taken to place them where needed next spring. A plan is now being worked out for this purpose.

DOMINION DEPARTMENT OF AGRICULTURE HONOUR ROLL

THE following is a list of the officers and employees of the Department of Agriculture who have enlisted for overseas service up to and including November 1, 1916:

INSIDE SERVICE

PATENT BRANCH

Nowlan, A., Ottawa.
Lawrence, J., Ottawa.
Osmond, Harold, A.M., Inst. C.E., A.K.C.,
Ottawa.
Withrow, W. J., B.A.Sc., Ottawa.
Bonnell, M. B., B.A.Sc., Ottawa.
Weldon, F. A., Ottawa.
Savage, E. W., B.Sc., Ottawa.

HEALTH OF ANIMALS BRANCH

Sharman, C. H. L., Ottawa.
Evans, T. C., B.V.Sc., Ottawa.
(Awarded Military Cross.)
Uglow, R. H. L., Ottawa.
Perney, E. D., Ottawa.
Dexter, F., Ottawa.

TRANSLATOR'S OFFICE

Bergoend, J. F., Ottawa.

PUBLICATIONS BRANCH

Anderson, F. E., Westboro, Ont.
Johnston, O. D., Ottawa.
Goold, W., Ottawa.
Todd, W. I., Ottawa.
Draper, P. G., Ottawa.

LIVE STOCK BRANCH

Fawcett, H. G., Ottawa.
Hunt, S. J., Ottawa.
Cox, G. C., Ottawa.
Richer, C. E., McG., Ottawa.

DAIRY AND COLD STORAGE BRANCH

Painter, E. W., Ottawa.

ENTOMOLOGICAL BRANCH

Fleming, H. S., Ottawa.

EXPERIMENTAL FARMS BRANCH

Browne, L. A., B.Sc., Ottawa.
Cole, D. S., B.S.A., Ottawa.
Davis, M. B., B.S.A., Ottawa.
Drayton, F. L., Ottawa.
Dreher, F. C. W., Ottawa.
Janson, J. T., B.Sc., Ottawa.
Kennedy, G. N., Ottawa.
McKibbin, R. R., Ottawa.
Nichols, R. W., Ottawa.
(Killed in action.)
Nicholson, A. V., Ottawa.
White, O. C., B.S.A., Ottawa.
(Mentioned in despatches.)

OUTSIDE SERVICE

- Thurston, E. C., D.V.S., Sydney, N.S.
 Watson, A., V.S., Lethbridge, Alta.
 Tambllyn, D. S., D.V.S., Regina, Sask.
 Poole, B. R., V.S., Regina, Sask.
 Maconachie, C., V.S., Victoria, B.C.
 Macdougall, W. F., V.S., Yorkton, Sask.
 Braund, F. J., V.S., Bannerman, Man.
 Unwin, G. H.
 Evans, H. C., Macleod, Alta.
 Metze, S., Macleod, Alta.
 Cousins, G. A., Pinhorn, Alta.
 Cameron, A. E., V.S., Lethbridge, Alta.
 Thornewill, G. S., V.S., East End, Sask.
 Hughes, J. T. M., M.R.C., V.S., Gleichen, Alta.
 Macdonald, R. W., V.S., Okotoks, Alta.
 Farrell, J. J., V.S., Strathmore, Alta.
 Simpson, J., V.S., Bassano, Alta.
 Brown, J. H., V.S., Gleichen, Alta.
 McNab, J., Macleod, Alta.
 O. Brunet, M. V., Montreal.
 Coleburn, H., V.S., Winnipeg.
 Collett, H. B., V.S., Calgary.
 Daigneault, F., M.V., Montreal.
 Douglas, K. L., V.S., Montreal.
 Elliott, H., M.D.V., Winnipeg.
 Fennemore, C. W., V.S., Toronto.
 (Invalided; injury to spine.)
 Walsh, F. A., V.S., Toronto.
 Flanders, C. M., V.S., Brantford.
 Morrin, W. A., D.V.S., Hamilton.
 Pook, G. G., V.S., Edmonton.
 Smith, C. E., Calgary.
 Whitehead, Geo., B.V.S., Edmonton.
 Bright, S. G., V.S., Moose Jaw.
 Guertin, J. O., M.V., Ingersoll.
 Kesten, S. H., V.S., Moose Jaw.
 Macfadzean, W. B., V.S., Toronto.
 Stuart, J. McL., V.S., Toronto.
 Tulloch, E., V.S., Maple Creek, Sask.
 Hawkins, W. E., Victoria, B.C.
 McNamara, J. P., Victoria, B.C.
 Tremayne, Dr. H. E., Prince Rupert, B.C.
 Warwick, Dr. Wm., St. John, N.B.
 MacKay, Dr. V. N., Halifax, N.S.
 Blackett, Dr. A. C., Halifax, N.S.
 Eastwood, Edward, Victoria, B.C.
 O'Hara, Patrick, Victoria, B.C.
 (Honourably discharged.)
 Sorensen, M. B., Lloydminster, Alta.
 Clark, T. O., Clark Manor, Alta.
 Stansfield, N.
 Wiltshire, W. E., New Westminster, B.C.
 Bent, H. V.
 Hudson, H. F., Strathroy, Ont.
 (Wounded; perm. disabled for active service.)
 Strickland, E. H., Lethbridge, Alta.
 Mackenzie, F. M., Fredericton, N.B.
 Walsh, F. W., Lethbridge.
 (Killed in action.)
 Brodie, H. S., Agassiz, B.C.
 Curran, H., Vineland, Ont.
 Williams, C. A., Fredericton, N.B.
 Ball, G. E., Fredericton, N.B.
 Flewelling, H. S., Fredericton, N.B.
 Shipton, J. C., Annapolis Royal, N.S.
 (Died in France.)
 How, L. M., Annapolis Royal, N.S.
 Fortier, T. H. H., Annapolis Royal, N.S.
 Harris, W. L., Annapolis Royal, N.S.
 Lord, S. N., Ottawa.
 Rankin, T., Ottawa.
 Bush, A. H., Vancouver.
 (Killed in action.)
 Allaway, J., Brandon, Man.
 Arden, J. A. P., Sidney, B.C.
 Armstrong, V., Brandon, Man.
 Atkinson, R., Summerland, B.C.
 Bennett, J., Lethbridge.
 Bergot, E., Lacombe.
 Blair, W. T., Kentville, N.S.
 Boates, H., Charlottetown.
 Boston, J. W., Brandon.
 (Killed in action.)
 Brydon, J. D., Agassiz, B.C.
 Cannon, A., Lacombe.
 Campbell, L., Lacombe.
 Campbell, Wm., Lacombe.
 Chesley, E., Ottawa.
 Corner, J., Summerland, B.C.
 Craig, E., Nappan, N.S.
 Craig, J., Indian Head, Sask.
 Curzon, J., Ottawa.
 Donaldson, R. B., Nappan, N.S.
 Donaldson, R. I., Nappan, N.S.
 Dorgans, G., Ottawa.
 (Wounded and returned to duty.)
 Dyer, W. H., Ottawa.
 Estabrooks, W. H., Fredericton, N.B.
 Everest, R. E., Scott, Sask.
 Fader, Eric., Charlottetown.
 Fahey, T., Ottawa.
 Ferris, C., Indian Head, Sask.
 Foley, Wm., Ottawa.
 Gallaher, J., Kentville, N.S.
 Godfrey, Wm., Rosthern, Sask.
 Godfrey, W. B., Indian Head, Sask.
 Golder, J. H., Indian Head, Sask.
 Gordon, W. A., Fredericton, N.B.
 (Died.)
 Gregory, Oliver, Charlottetown.
 Haddrell, C. W., Summerland, B.C.
 Hall, L. J., Rosthern, Sask.
 Halfpenny, Eric, Nappan, N.S.
 Harrison, C., Lennoxville, P.Q.
 (Killed at Ypres.)
 Hatherall, F., Ottawa.
 Hazen, F. H., Fredericton, N.B.
 Heatherton, W., Ottawa.
 Hesselwood, H., Rosthern, Sask.
 Hobden, R., Rosthern, Sask.
 Holmden, R., Ottawa.
 Hubbard, G. A., Fredericton, N.B.
 Huestis, H. W., Ottawa.
 Humbert, P., Ottawa.
 (Killed in action.)
 Jaquemet, F., Ottawa.
 Johnson, L. I., Ottawa.
 Joudoin, D., Ottawa.
 Joyce, Martin, Summerland, B.C.
 Lindesay, H. H., Ottawa.
 Longworth, F., Charlottetown.
 Lothian, D. E., Ottawa.
 Mackintosh, J., Lethbridge.

- Macleod, J. S., Indian Head, Sask.
 Marshall, C. A., Summerland, B.C.
 Mason, E., Ottawa.
 Matthews, A. E., Ottawa.
 Matthews, V., Lethbridge.
 McCool, P., Nappan, N.S.
 McCormack, V., Rosthern, Sask.
 McDonald, J., Ottawa.
 McDonald, J., Nappan, N.S.
 McDonald, J., Agassiz, B.C.
 McKay, G., Charlottetown.
 McKenzie, G. F., Summerland, B.C.
 McNeill, A., Lacombe, Alta.
 Mynot, A. E., Brandon, Man.
 Naper, F. C., Summerland, B.C.
 Neal, C., Ottawa.
 Neeley, H., Agassiz, B.C.
 (Wounded.)
 Neilson, M. A., Ottawa.
 Nelson, E. E., Summerland, B.C.
 North, S., Ottawa.
 Paris, R. J. C., Lethbridge.
 Pennington, A., Agassiz, B.C.
 Peters, S., Summerland, B.C.
 Peterson, P., Brandon, Man.
 Peterson, A., Rosthern, Sask.
 Pollock, W., Agassiz, B.C.
 Pringle, E. H., Brandon, Man.
 Ramsay, R. L., Agassiz, B.C.
 Rennie, J., Indian Head, Sask.
 Robertson, D., Nappan, N.S.
 Robinson, M., Kentville, N.S.
 Rutledge, W., Agassiz, B.C.
 Sansom, E. N., Fredericton, N.B.
 Sculthorp, H., Summerland, B.C.
 Sheldon, A., Fredericton, N.B.
 Small, R., Ottawa.
 Smart, R., Lethbridge.
 Smith, C., Lennoxville, P.Q.
 Smith, H., Summerland, B.C.
 Snider, H., Ottawa.
 Struthers, A., Lacombe, Alta.
 Sutton, S., Nappan, N.S.
 Sweatman, E., Agassiz, B.C.
 Taylor, J., Indian Head, Sask.
 Thornthwaite, H., Summerland, B.C.
 Tulley, H., Indian Head, Sask.
 Verne, B., Lennoxville, P.Q.
 Valiant, S. H., Brandon, Man.
 Walker, A., Lethbridge.
 Walker, J., Lacombe, Alta.
 Walton, H. A., Summerland, B.C.
 Webster, L. F., Fredericton, N.B.
 White, W. R., Ottawa.
 Williams, C. M., Nappan, N.S.
 Williams, G., Summerland, B.C.
 Williams, J. C., Summerland, B.C.
 Wishom, C., Agassiz, B.C.
 Wood, J., Brandon, Man.
 Keegan, H. L., Calgary, Man.
 Eastham, A., Calgary, Alta.

The apple orchards at the Central Experimental Farm were started in 1887, but it was not until the spring of 1888 that much progress was made. Since that time the number of varieties tested and the area devoted to this fruit have both increased very much. Up to the present time 734 named varieties have been tested, of which 613 are now growing. Many other unnamed seedlings sent in for test have also been tried. Many of the varieties have been replaced several times so as to be certain that they were too tender for this climate. The Russian apples have received special attention as it was thought that these would prove of particular value for the northern parts of this country. There have been about 160 Russian varieties tested, though many thought at first to be different have proved to be identical. There are 1,114 apple trees in permanent positions in the main orchards, occupying about 18½ acres, and 61 crab apples. There is also a small closely planted orchard mainly of the Wealthy apple; another small orchard containing trees of the best seedlings originated at Ottawa. Still another small orchard contains trees of cross-bred apples originated in the Horticultural Division. There is also an orchard containing cross-bred apples originated by the late Dr. Wm. Saunders, and there is another orchard of seedling apple trees. Scattered through the permanent orchards and used as fillers between the permanent trees are seedling and cross-bred apple trees which are left until they fruit. In all about 25 acres were devoted to the apple in 1915.—*The Dominion Horticulturist* in "The Apple in Canada."

PART II

Provincial Departments of Agriculture

AGRICULTURE IN CANADA

The "Agriculture in Canada" series, which began in the May number, is concluded in this issue with the sections dealing with the provinces of Alberta and British Columbia. This series, which has been written by the Deputy Ministers of Agriculture or their representatives, covers the whole of Canada. It constitutes an important feature of Volume III and will be reprinted in pamphlet form.

ALBERTA

BY J. MCCAIG, EDITOR OF PUBLICATIONS, DEPARTMENT OF AGRICULTURE

THE total area of Alberta is 255,285 square miles. The land surface is estimated at 252,925 square miles and the water surface at 2,360 square miles. While it is not possible to give close figures on the acreage of good land in Alberta, it is estimated that of the 161,872,000 acres, 100,000,000 acres are suitable for cultivation. Of this area less than 4,000,000 acres, or 4 per cent, have been brought under cultivation. The crop area for 1915 is given as 3,834,738 acres.

PHYSICAL PROPERTIES

The province of Alberta displays a large diversity in its agriculture. This is due, primarily, to variations in climate of both a general and special sort and, secondarily, to soil and surface character, though the two factors of climate and surface conditions are rather closely connected. Generally speaking, the area known as the Prairie Provinces consists of two more or less distinct kinds of country. The southern part is open prairie over the whole of the interior great plain district. The northern part is practically open and is principally covered with light timber or scrub in bluffs, with heavier patches of timber along the river valleys. In the extreme upper section, the vegetation declines in height, luxuriance and variety. In

Alberta the same conditions do not prevail. There is a greater diversity in surface features, a much greater variety in climate, and also a difference in the adaptations of different parts of the province to productive use. While the greater part of Alberta is open prairie and constitutes what is commonly called the third prairie steppe, the elevation varying from 2,000 to 4,000 feet, and on the west side of the province as far north as the Rocky Mountains touch it, which is about half way up the west side, there is a strip about sixty miles wide consisting of what is called the foothills country. There is no second range of mountains within the main range of the Rockies, but the foothills are so numerous as to give a consistently broken and varied character to the surface. It is cut by deep canyons and there is considerable timber, particularly along the rivers. On the open prairie itself, the bench land is cut by numerous coulees running back for a considerable distance at right angles to the rivers. This description of surface applies chiefly to the southern part of the province, approximately 200 miles in width from north to south.

The central part of the province is a good deal like the corresponding area in Saskatchewan and Manitoba.

There is considerable scrub on the land, in some places light and in others rather heavy, and there are also numerous bluffs or taller growth made up principally of poplar, which is commonly described as pole timber. The rivers likewise cut deep channels, sometimes 200 or 300 feet, just as they do in the southern part of the province. Along the rivers there is considerable timber: spruce, fir, birch and poplar. The northern part of the province, on the other hand, is somewhat different from the northern part of the other provinces. Towards the eastern boundary of the province, there is

development towards the northern parts of the province.

CLIMATE

While the climate of all three prairie provinces is generally characterized as extreme, there are influences operating directly in the case of Alberta that mitigate its extreme character. The same conditions are responsible for differences in effective precipitation between the southern and central parts of the province, and also for the matter of the settlement of the northern part of the province, as has been already mentioned.



PURE-BRED SHORTHORNS IN CENTRAL ALBERTA

some rough and broken country, but in the western part, that is, the upper Peace River valley, there is excellent agricultural land, a great deal of it being open and such as the ranchman would call short grass country. It has already undergone considerable settlement, and, with the further extension of transportation will become well populated. With respect to this feature of a possibility of northern development Alberta stands to some extent by itself. The difference in surface appearance and vegetation of these different areas is largely a matter of climate, as is also the matter of

THE CHINOOK INFLUENCE

The outstanding feature of climate is the chinook wind. The chinook may be described as a warm, dry wind descending from the southwest on the interior slope of the Rocky Mountains. Its warmth was supposed to be actually due to the Japan current. This belief is still common, but by the best authorities it is now explained as a dissipation of air from a high pressure area in the Rocky Mountain plateau itself. Condensation of moisture on the western side of the mountains releases the heat which is communi-

cated to the air itself and the compression of the air by the upper layers as it travels down the descent of the eastern slopes makes it to a still greater extent a warm, dry air. The chinook influence is quite strong and characteristic in the southern part of the province, and the same general influence operates throughout the whole of the inner slope of the Rockies, but to a much lesser degree in the central and northern parts of the province. It is this influence that gave Southern Alberta its reputation as a ranch country. The chinook is not a persistent wind, but occurs from time to time during both winter and summer. In winter it breaks up the severity of the season probably four or five times between November and April, and uncovers the native grasses, so that it has been possible to graze stock outside during the whole year. It was due to the chinook winds that the first cattle enterprises were established in Alberta. As far back as the early 70's, cattle were brought in from Montana to the Macleod district, the first being the property of Mr. Joseph McFarlane. This grazing enterprise was the beginning of Alberta agriculture. Since that time, the development has been extremely rapid and we have had in quick succession, or side by side, the rancher, the grain-grower, the dairyman, the stock-raiser and the irrigator.

THE UPPER SASKATCHEWAN

It might have been expected that the settlement of the province would proceed from the nucleus of western development in the Selkirk Colony on the Red River, but population and transportation were covering the West much more rapidly in the United States than in Canada, and the beginnings in activity in the use of land in Alberta appeared first as side springs from the United States pioneering movement. So far as the Selkirk Colony had shown any

expansion, growth promised chiefly along the north Saskatchewan valley by way of the Touchwood hills to North Battleford and Edmonton. This was but the spur of fever in the blood of the pioneer and had practically no commercial aspect. Such settlement as did take place was that of isolated cabin buildings on garden spots backed by the woods and warmed by the sun, and beside the flowing springs. A garden was as good as all outside, for there was no fat traffic in the things the earth provided anyway. There is a certain type of real pioneer who is not of the neighbour hunting sort. There are a few of these left in all the western provinces, men of great individuality with a simple code of honour and a simple standard of living.

THE STEEL LINK

The integration of Alberta with the rest of Canada for modern business occurred in 1885, with the completion of the Canadian Pacific railway. Whether the blacklands of the Upper Saskatchewan were intrinsically more desirable than the chocolate soil of the open prairie was not the question. There is no doubt but that wood is a desirable accessory to land, and in some cases the lack of water is a drawback, but the railway determined the movement of settlement from 1885 on. Calgary became an important town by reason of its connection with the commercial world. It still remained, however, a cow town until about 1900, and the country tributary to Calgary, to the boundary on the south, and the Red Deer on the north, was cow country. The other important centres about which the cow business was active were MacLeod, Lethbridge and Medicine Hat. To say that the country was a cow country is not to say that there were no settlers who contemplated farming, but that ranging was the dominant interest. The fundamental reasons for this type of development in

Southern Alberta were the chinook winds and the superior quality for both summer and winter grazing of the native grasses.

CENTRAL ALBERTA

In 1891, the Calgary and Edmonton branch of the Canadian Pacific railway was laid through Central Alberta with terminus at Strathcona. The country opened up by this north and south line is scarcely the same as the country under the characteristic influence of the chinook. The land is heavier and blacker; it has a

of mixed farming and of the country generally is considerably greater to the south than it is to the north of this centre. It is in this area that most of the dairy and special live stock enterprises of the province occur.

PEACE RIVER VALLEY

Alberta is really three provinces in one. It consists of the area under the chinook, which we shall call Southern Alberta, of Central Alberta, and of the Peace River country. The history of the Peace River



RANGE BANDS ARE STILL COMMON
Alberta, in 1915, had 238,000 Sheep

heavier type of vegetation; it retains its moisture well and there is less dissipation of moisture through the influence of drying winds. The class of settlement that took place along this line, right from the beginning, has been farm settlement. It is essentially a mixed farming country and at present exemplifies more special and intensive farming enterprises than any other part of the province. It, likewise, carries the densest population of any part of Alberta. Edmonton may be taken as the centre of this area, though the development

country is still to be written, but it is evident that home-making activities and heavy production will extend to a good distance north in this province. The building of railways has been rapidly followed by settlement and already a considerable volume of products, such as oats, wheat and also hogs, has found its way to Edmonton markets.

The Peace River country presents an attractive variety of resources. A good deal of the country is open, short grass country and the severity of the climate seems to be, to some

extent, ameliorated by a modified chinook influence. Other parts are a happy combination of open country and useful bluffs and the land is well watered.

THE IRRIGATOR

While the history of the northern part of the province is still to be written, and, while the character of the agricultural development of the central part of the province is more or less definite and fixed in character and has been the same from the beginning, Southern Alberta, on the other hand, has passed through a number of interesting and varied phases of development in a short period of time. The simple type of pastoral industry, represented in cattle, horse and sheep ranching, and which lasted up till 1900, was rather suddenly and drastically changed through the introduction of irrigation enterprises rather than through the gradual substitution of farm enclosures for the open range. It is not uncommon to read that Southern Alberta is too dry to raise crops without irrigation. This is a matter of superficial inference prompted by the fact of irrigation having been established in Southern Alberta.

Southern Alberta now has three large irrigation enterprises. The first of these was established about the year 1900, with headquarters at Lethbridge. It receives its water supply from the St. Marys river and the scheme takes account of the effective watering of about one-half million acres of land. This enterprise has been acquired by the Canadian Pacific Railway. The Canadian Pacific Railway Company established a still larger enterprise east of Calgary, with water service supplied from the Bow river, which undertook to water one million out of the three million acres of the total property in land held in this area by the company. The third enterprise was that of the Southern Alberta Land

Company, with headquarters at Medicine Hat. It likewise draws its supplies from the Bow river. It controls a total of one and three-quarter millions acres of irrigable land in these three enterprises alone, and there are a number of small ones besides.

Irrigation commonly means crop insurance, heavier crops, a greater diversity of crops, particularly in forage, roots, etc., and it makes live



THE RAPE PLANT IN ALBERTA

stock breeding and the establishment of commercial feeding enterprises certain and profitable. The value of irrigation in the production of crops has been fully demonstrated in Southern Alberta in relation to grain, fodders, especially alfalfa, roots, potatoes, etc., but there is scarcely so much to be said for the use that is made of the crop.

Irrigation is somewhat expensive in relation to ordinary grain farming,

and there is considerable straight grain farming carried on in the irrigated districts. Of better profit on irrigated lands is the practice of growing large quantities of a superior type of fodder, also some roots and a little grain, and the marketing of these through live stock. Besides the habit of grain-growing being too prevalent, where fodders are grown they are likewise sold off the farm. Seventy-five per cent of the alfalfa, for example, grown in the Lethbridge district is marketed for cash instead of through live stock.

DRY FARMING

The irrigation enterprises of the province as such are large and ambitious enterprises, but in relation to the whole of the agriculture of Southern Alberta, their importance is over emphasized. They are among the big things that stick out for the newspaper man. They are really important in Alberta agriculture on account of the intensive modern type of work for which they stand in the first place, and for starting the dry farmer coming in the second place. Irrigation was no sooner established in Alberta than there followed quickly a large immigration of farmers, who believed that they could produce crops successfully in Southern Alberta without artificial watering, and there is no doubt but that they have made out their case, but without reduction in the credit, benefit or advantage of irrigation.

There is no doubt but that the making common of the knowledge underlying the practice of dry farming, and the making common of the practice itself, have been of the greatest benefit to general agriculture. An examination of the precipitation records for points in Alberta shows that there is not much difference between Central and Southern Alberta as to the total or absolute precipitation. The average for the Edmonton district is between eighteen and twenty inches and for

the Calgary district the average falls within the same limits. To put the matter in a simple way; Southern Alberta looks dry on the unbroken prairie and in a certain sense is dry because the run-off is very rapid on unbroken prairie. The chinook wind likewise gets away with a lot of moisture both in summer and winter. It will remove a foot of snow in three or four hours, or, what it does not remove, it will drive into the coulees, and it is likely to do this two or three times during a winter. Towards the end of June or the first of July, it will change the whole prairie vegetation into well-cured hay.

The problem of the man who decides to change a piece of the prairie into a farm is to get the water into the land and keep it in. The breaking of the prairie creates a reservoir for moisture, the working of the surface keeps the moisture from travelling back into the air. The dry farmer is really in conflict with the chinook and he can beat it out by deep ploughing, the summer fallow, surface working and in some cases by cover crops, packing, stubble manure, etc.

The largest yields of grain in the province during the past two years have been in Southern Alberta on lands that were not artificially watered. It is quite true that the seasons have been very favourable. The rainfall has been heavy during the growing season. In 1912-13-14, there were a good many failures in Southern Alberta, but there were likewise some successes.

MIXED FARMING UNIVERSAL

The changes which have come over Southern Alberta have resulted in making the whole of the province a mixed farming country. The big stock ranges are, to a large extent, a thing of the past. They are, at least, in the cases of horses and cattle. The sheep men, however, are holding on successfully. They have to dodge about more

than pleases them among the wire fences, but sheep have to be herded in any case and are better adapted than either horses or cattle to use the scattered pieces of unoccupied land between the farms. There is no doubt, but that the proportion of land devoted to grain on Southern Alberta farms is, and will continue to be, larger than in Central Alberta. At the same time Southern Alberta farmers are trying to increase their stock.

ANNUAL FODDER CROPS AND ENSILAGE

It cannot be said that on Southern Alberta lands we have succeeded in

alfalfa, corn and oats, and other mixtures have been used for ensilage with entire success.

The purpose of this somewhat lengthy setting out of the history of Alberta agriculture is to show that over the whole of the province of Alberta there has been an effective adjustment of farming methods to conditions such as to make all good land productive and profitable, and to give to all our work the necessary quality of conservation besides.

FIGURES ON ALBERTA PRODUCTION

The habit of setting out our achievement in figures is a popular one in Western Canada. So much



FODDER CORN IN SOUTHERN ALBERTA

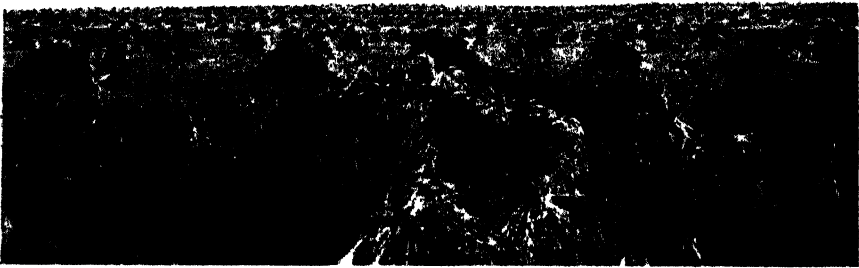
establishing good tame meadows. Alfalfa, however, succeeds on both irrigated and unwatered lands. The bulk of summer fodder on cultivated land is from such crops as fall rye and grain mixtures, rape, etc. The production of adequate forage, however, is wholly possible. On both the provincial demonstration farms in Southern Alberta large dairy enterprises are carried on and home-grown feed is plentiful on both places. There is a silo on each demonstration farm in the province. At Claresholm, Medicine Hat, Sedgewick and Vermilion, fodder corn for this use succeeds well. At Olds and at some of the farms already mentioned, green oats, oats and peas,

development of every sort has been compressed into a small period of time that figures in relation to western progress commonly listen well. The following table, for example, indicates the progress that has been made in bringing lands under the plough and in increasing the production of grain:

	Total Crop Area	Total Yield of Grain
1906.	591,614	19,333,266
1907	576,821	14,588,852
1908.	837,641	25,073,147
1909.	1,242,644	36,761,493
1910.	1,193,261	22,027,184
1911.	1,732,648	50,907,531
1912.	2,391,752	64,465,058
1913.	2,799,267	75,575,682
1914.	2,586,169	58,895,709
1915.	3,668,238	164,332,483

This, roughly speaking, is a seven or eight-fold increase in acreage and grain in a decade. The total production of 1915 grain in the table above is nearly three times as much as the production for the year 1914. There are two reasons for this. The first is the encouragement given by both the Dominion and the Provincial Governments for the production of food supplies during the war time. The other reason is the phenomenal season of 1915. During the grain season of 1915 (this may be taken to include May, June and July), the total precipitation in Southern Alberta was two and one-

in the province will take comfort in observing that, while the wheat yield of 1915 was such as to establish a wonderful reputation for production, and was such as to put many farmers, very much in need of it, well on their feet, we in Alberta swing strongly towards the production of coarse grains. While our total wheat production last year ran to sixty millions, our production of oats, barley and rye ran over one hundred millions. This is a necessary condition for the support of the live stock and dairy enterprises, which are becoming year by year more important in the agricultural



A CHARACTERISTIC WHEAT FIELD
In 1915 Alberta produced 60,000,000 bushels of wheat.

half times as great as it was in the previous year. Some phenomenal yields of wheat were reported from Southern Alberta both last year and this year, which show the adaptability of the Southern Alberta climate and its soil for wheat production. An outstanding example is the case of Mr. Noble, of Nobleford, Alberta, who this year breaks the thousand-acre record for spring wheat with the yield of 54.39 bushels. In spite of the signal successes here recorded in wheat growing in Alberta, those who are interested in the achieving of a permanent type of agriculture

work of the country.

The average yields of standard grains, spring wheat, winter wheat, rye, barley and oats, over a period of ten years, are as follows:

Spring wheat	20.16
Fall wheat	22.40
Oats	36.99
Barley	26.60
Rye	19.32

CONSTITUTION OF NORTHERN SEED GRAIN

As has been shown, Alberta, in common with the other prairie provinces, shares an enviable reputation

in the contribution of liberal supplies of commercial grain to the food resources of the Empire. In addition to this, there is an important development of specialized seed production appearing in the province. It is a recognized law in seed production that the farther north a crop can be made to mature satisfactorily, the better constitution the seed has. There has already been considerable evidence of the superiority of Alberta seed grain. Turkey Red from Kansas, when grown in Alberta, was given a separate grade by reason of its superior quality, and became Alberta Red. It weighed more to the bushel and produced a larger and bolder kernel. The same thing is happening with regard to spring wheat. Samples of Alberta oats have been known to go fifty-one pounds to the bushel, and at one of the provincial seed shows the ten first samples went over forty-eight pounds to the bushel. Within the past two years sufficient business has been done in the placing of timothy seed on eastern markets to indicate that in the future we shall have considerable business in the production of grass seed. The production of alfalfa seed is in its beginning, but experiments with home-grown seed have demonstrated its superiority over the imported seed that is used. On the whole, there appears to be a chance of building up on our general agricultural production a superstructure of specialized work in the furnishing of a good class of seeds to some of the other provinces of the Dominion, and to the northern tier of states. Large supplies of oats have already found their way through the seed houses to the United States' markets and, this year, spring wheat will probably be furnished in large quantities.

LIVE STOCK CENSUS

It appears to be difficult to show by figures the development of the live stock industry of the province. Export figures are commonly secured from the transportation companies. These records are kept in different ways by the different companies. Export figures, likewise, do not teach us much with respect to production. There have been times when the increase in population was so rapid in the province, that production could not any more than keep pace with it. The cattle business has been rather unsettled, likewise, on account of the change from ranching to farm conditions. The same is true with respect to horses. The hog business has gone up and down in the different years with characteristic suddenness. The sheep business has, perhaps, been less subject to fluctuations than any other line of live stock work. Ranging of sheep still persists though it has not expanded. There has been a gradual increase in farm sheep and a tendency towards the larger introduction of sheep both in the mixed farming area and in the special grain-growing country. Apart from the present condition of stimulation of sheep interests, due to the high prices of mutton, and more especially wool, the sheep business has really languished, for it has not displayed a growth to parallel the general development of the province. Estimates vary between a quarter and a half-million, while it is quite clear that we could profitably maintain two or three millions. The pure-bred sheep business is improving. Alberta is the third among the provinces in the registration of pure-bred sheep, and it has a total about as large as the other two prairie provinces together in sheep of all kinds.

DAIRY PRODUCTION

The dairy interests of the province are in a very healthy condition. Our production is increasing rapidly. The standard of our products is improving and is now recognized as high. The work of the Department of Agriculture which stands between the consumers, including the trade, on the one side, and the producers, including the manufacturers, on the other side, is resulting in good things. During the year 1915, the total production of creamery butter was 7,376,871 lb., which was an increase of 35.48 per cent over the production in the previous year. The output of cheese was 372,693 lb., as against 70,580 lb. in 1914. There were 57 creameries and 13 cheese factories in operation during the year. The principal markets for Alberta butter have been, and still are, British Columbia and the Yukon. In British Columbia, the Alberta product is displacing New Zealand butter. Last year, ten cars were, likewise, shipped to Montreal and Toronto. The Commissioner's office in Calgary marketed ten per cent of the creamery product. The Dairy Commissioner has succeeded in making the closest possible adjustment to the needs of consumers and the trade with respect to the way butter is put up. On the side of production, the closest scrutiny and inspection are carried on in regard to the manufacturing processes, and during the year ninety-six per cent of the cream used was bought on grade.

The development of production in both butter and cheese over the last ten years is shown in the following table:

	Creamery Butter	Cheese
1906.. .. .	2,000,000	97,739 lb.
1907.. .. .	1,500,000	195,000 "
1908.. .. .	2,100,000	190,000 "
1909.. .. .	2,550,000	224,000 "
1910.. .. .	2,315,000	220,000 "
1911.. .. .	2,540,000	100,000 "
1912.. .. .	3,000,000	40,000 "
1913.. .. .	4,115,000	70,716 "
1914.. .. .	5,450,000	70,581 "
1915.. .. .	7,376,871	372,693 "

DIRECTIVE AND EDUCATIONAL FORCES

The discussion of Alberta agriculture would be wholly incomplete which did not take account of the work of the Department of Agriculture for the province. The organization and working of administrative and educational agencies are as much a part of agricultural achievement and potentiality as the growing of fifty pound oats or the making of Alberta creamery firsts. The Department of Agriculture has always carried out active educational work in the interests of the fundamental industry of the province. This includes both popular education and systematic agricultural education. We quote from the annual report of 1915 what may be taken to be the position of the Department with regard to the need of aid to the settler:

"The conditions of the country by reason of its newness involves active administrative and executive work, but, likewise and chiefly, a great deal of educational and directive work. Most of our people are on the land. Most of them are from other countries or other provinces of the Dominion itself. The conditions of soil, season and general climate are new to them. Many of them have not farmed in any country or at any time before. This makes necessary the carrying on of a vigorous policy in popular and practical education, that is, the education of adults who are actually engaged in farm work. To this end, all the branches of the Department carry on active educational work, through the demonstration farms, fairs, and institutes, conventions, district agents' work, short course schools, demonstration trains and through bulletins and correspondence. There is likely to be a constant and continuous demand and need for this type of work. New crops, new methods of soil and farm management and the opening of new areas are going to make it necessary to give all the direction and assistance possible to those on the land to enable them to establish prosperous homes and enterprises and to promote national production. It is true likewise that western farm communities are eager for information and improvement and are quick to put into practice new plans and ideas."

AGRICULTURAL SCHOOLS

The Department of Agriculture has established a system of what might be called Trade or Technical Schools in agriculture for the assistance of the farm boys and girls of the province. There are three of these now in operation and the number will probably increase. Stated briefly, these schools give a two years' course, with five-month sessions in each year, beginning in November and closing at the end of March. The work for boys consists of field husbandry, animal husbandry, farm mechanics, veterinary science, dairy, poultry and horticulture, elementary chemistry, physics, botany and entomology underlying agriculture, farm management, book-keeping and English. The girls have cooking, sewing, laundry, home-nursing, sanitation, together with the sciences underlying their work, English and mathematics. The courses in dairy, poultry and horticulture are open to girls as well as boys. Courses are free; they are held in winter when the boys can get away from the farm. The work is co-educational as far as possible. Considerable attention is paid to extending the social experience of pupils. At the same time, the schools are actually situated on farms and are, in all cases, essentially rural districts, and not adjacent to

large towns or cities. The schools, as a development in agricultural education, appear to stand out as the first successful attempt in the Dominion of establishing special educational services for farm boys and girls in the period between the public school and the university, assuming that the state has a right and duty to provide a complete system of educational services in agriculture.

The Department of Agriculture works in effective harmony with the Department of Education and the university. The Department of Education has arrived at a definition and limitation of the scope of agriculture in the public schools with respect to which the Department of Agriculture is in full accord. The Department of Education does an important work in school gardens; the district agents of the Department of Agriculture are doing an important work in home gardens among school children. The provincial schools of agriculture serve not only as special training schools with regard to the practice and science of agriculture and home-making for boys and girls who are going back to the farm, but they are, likewise, articulating and preparatory schools in relation to the faculty of agriculture in the university. Last year thirteen boys from the schools of agriculture were in attendance at the university.

BRITISH COLUMBIA

BY WM. E. SCOTT, DEPUTY MINISTER OF AGRICULTURE

BRITISH COLUMBIA, the Pacific Maritime Province of Canada, has an area of approximately 372,000 square miles, or 238,080,000 acres. To give an idea of size by comparison, this area is greater than the combined areas of the British Isles, France, and Belgium, or slightly less than the combined areas of Germany and Austria-Hungary.

The province is bounded on the south by the American States of Washington, Idaho, and Montana, on the north by the Yukon and Mackenzie territories, on the east by the Rocky Mountains, and on the west by the Pacific Ocean and a portion of Alaska.

British Columbia is the western gateway of Canada, and through its

portals in the future is bound to flow a large part of Canada's trade to the Orient, antipodes, and, now that the Panama canal is an accomplished fact, to the nations of the old world also. A considerable portion of the produce from the golden grain fields of the Middle West will also be diverted this way, and passing through the ports of Vancouver, Victoria, and Prince Rupert, will then be carried to the markets of the world by sea-going traffic.

Before it was better known, British Columbia used to be referred to as a "sea of mountains". It is true that a large proportion of the province is composed of mountain ranges covered with stately trees of Douglas fir, cedar, spruce, hemlock, tamarack, pine, and other commercial timbers—an inexhaustible supply of national wealth—and, also, hidden in the bowels of the earth, awaiting development and exploitation by the enterprising hand of man, are unlimited supplies of gold, silver, copper, lead, zinc, iron, coal, and other minerals.

But, in addition to these potential sources of wealth, we have a large area of the finest kind of agricultural land, in our fertile valleys, benches, and plateaus, where everything that is necessary for the most successful prosecution of agriculture in all its branches, and for the highest production from the soil, is present.

EVOLUTION OF FARMING

The first farming done in the province was in the neighbourhood of the city of Victoria, on Vancouver Island, and New Westminster on the Lower Mainland. These are the two oldest cities of the province, and on the neighbouring lands, stock and farm produce was grown to supply the wants of these small, but growing cities.

Later, in the '40's, the great gold rush to the Cariboo took place, and many people realized that here was a golden opportunity to supply

with produce at good prices the mining camps that were constantly springing up on all sides.

It was at this time that the beginning of the stock ranging industry took place, and bands of cattle were pastured on the Chilcotin, Thompson, and Nicola valleys—districts in which the bunch grass grows.

From now on, agriculture began to slowly increase. Many of the hardy pioneer Cariboo miners, after having amassed a competency, retired from the strenuous life of hunting for the precious metal, and took up land on the picturesque banks of the Fraser or Thompson rivers, or on the fertile plains of the Lower Mainland, or Vancouver Island.

It is only, however, during the past twenty years that any material progress has been made in agriculture. During this time, many settlers, principally from the mother land, have been attracted to this province and have settled in all our agricultural districts, engaging in fruit growing and mixed farming.

A considerable settlement has also taken place from Eastern Canada and the Prairie Provinces, and the United States, people being attracted by the many advantages offered for the making of happy homes amidst pleasant surroundings.

FARMING POPULATION

British Columbia has a total population estimated at 450,000. Out of this, the farming population is about 75,000. Home production for the year 1915 totalled \$31,127,000, giving a *per capita* production for every man, woman, and child in the province of about \$70.

AREA OF AGRICULTURAL LANDS

Various estimates have been made as to the amount of land in the province suitable for agriculture.

It is impossible, in a province of the character of British Columbia, to give any reliable figures, owing to the size and configuration of the country. Any statement in this regard that may be made can only be an estimate. The writer would state that in his opinion there are at least 20,000,000 acres of land suitable for farming in the province, and, in addition, many millions of acres suitable for pasturage purposes.

A large part of the great Peace River district is practically unexplored, and very little is known about the agricultural possibilities of the Omineca, Cassiar, and Atlin districts.

CLIMATIC CONDITIONS

In a province the size of British Columbia it is only natural that climatic conditions should vary considerably. In the northern confines of the Peace River district the growing season is short, and the winters cold, whilst in many of the southern sections almost sub-tropical conditions exist.

The Japanese current crosses the Pacific with a westerly drift, laving the shores of Vancouver Island, the Gulf Islands, and the Pacific littoral, thereby giving to these districts a mild and equable climate the year round.

The spring, summer, and autumn months are bright, sunshiny, and with no excesses of heat, the winters mild and rainy. The unique climatic conditions enjoyed by these favoured sections have made them very popular from a residential standpoint, people being attracted thither from all parts of the world by the delightful climate, magnificent scenery, and fine sporting attractions which are afforded.

The warm winds caused by the Japanese current, after it reaches the coast, are carried in an easterly direction until they are arrested by the coast range, in passing over which they lose their moisture-laden con-

tents, and become rarified, thus giving to the interior valleys and plateau lands a drier climate, with warmer summers and colder winters.

AGRICULTURAL AREAS

In order to give a general idea of the different conditions obtaining in the various sections of the province, the following short description is submitted:

For the sake of convenience the province may be divided into five different districts, each with different climatic conditions:—

(1) *Vancouver Island and adjacent Gulf Islands.*—This district is covered with a growth of commercial timber varying in density, and consisting principally of Douglas fir, cedar, spruce and hemlock. Whilst the cost of clearing the heavier timbered portions is high, and in many cases prohibitive, there are many parts in which the costs of land clearing are reasonably low, and consequently a considerable amount of land settlement has been effected.

Vancouver Island is essentially adapted for intensive diversified farming on a comparatively small acreage. It is particularly well suited for dairying, poultry, sheep and hogs.

Tree and small fruits grow well on suitable soils, and yield abundant crops of the best quality of fruit. A great variety of garden produce is also grown to the best advantage.

The average rainfall of the southeastern part of Vancouver Island is approximately 40 inches, whilst on the west, northern coasts, and interior parts of the island, there is a considerably heavier precipitation, ranging all the way from 40 to 120 inches.

Some settlement has been effected on the west coast of the island, and crops of all kinds yield well.

The cost of clearing the virgin forest and the excessive precipitation are the chief retarding factors to a more rapid settlement.

On the east coast of Vancouver Island, between Victoria and Prince Rupert, are many islands, on which there is a considerable amount of farming carried on. The most southerly of these islands are veritable gems of the Pacific, with ideal climatic conditions, and wonderful scenic attractions. As on Vancouver Island, mixed farming is principally followed. A very fine quality of fruit is grown on the Gulf islands, with good colour and keeping qualities.

fodder plants, roots, small fruits and garden produce. Crops of 100 bushels and over of oats to the acre are quite common, and hay will yield as high as five tons per acre.

It is primarily a stock and dairying district. Pasturage grows in rank luxuriance, and, with the mild winters experienced, stock can pasture outside practically the year round. Very fine herds of pure-bred dairy cattle, sheep and hogs, are seen on all sides.



STRAWBERRY GROWING, VANCOUVER ISLAND

(2) *Lower Mainland.*—This district includes what is commonly known as the Delta of the Fraser river. It is a tract of country between the coast range and the sea, formed of alluvial silt, which, through countless ages, has been washed down from the mountain ranges of the interior by the turbulent waters of the mighty Fraser river.

This highly productive area grows heavy crops of grain, hay, grasses,

The timber on the uncleared land is fairly heavy, but the proximity of these lands to the large market of Vancouver, and their wonderful productiveness, justify the expense of clearing in most instances.

Poultry raising is also extensively followed. Some sections of the higher lands are well suited to both tree fruits and small fruits. There is a considerable trade done with the prairie provinces, in rhubarb, strawberries, raspberries, loganberries, etc.

The rainfall in this district will average about 65 inches.

(3) *Interior valleys of Southern British Columbia.*—This section takes in all the country south of the line of the Canadian Pacific railway to the international boundary line, between the coast range and the Rocky Mountains, the principal districts being the Thompson valley, Nicola, Okanagan and Shuswap, Similkameen, Boundary, Kettle val-

It is estimated that the Okanagan valley alone will ship out during the present year about 2000 carloads of fruit, and 1000 carloads of vegetables, this produce going principally to the markets of Alberta, Saskatchewan and Manitoba, and considerable shipments are also made to New Zealand, Australia, and South Africa. These valleys, in addition to being fruit districts, are also well adapted to mixed farming. Alfalfa and corn



DAIRY AND POULTRY FARM, LOWER MAINLAND, B.C.

ley, Slocan and Arrow lakes, East and West Kootenay, and Columbia valley.

Most of these valleys have been developed along fruit-growing lines, for which they are so eminently adapted. A remarkable quality of fruit is grown in these beautiful sheltered fertile valleys, which has captured leading awards at all centres in which fruit has been exhibited.

grow to the best advantage, thus affording the right conditions for the most economical raising of stock.

The present tendency amongst farmers is to engage more in mixed farming, in addition to their fruit-growing, to keep more stock on the place, and thus add to their returns, and at the same time conserve the fertility of the soil.

Silos are being erected on all

sides, and the number of stock kept is rapidly increasing.

The climatic conditions in these interior valleys are radically different from those obtaining in the Coast sections. The spring, summer, and autumn months are ideal, whilst the winters are cold, but with plenty of bright sunshine.

Crops are grown under irrigation in most of these valleys, many extensive irrigation systems having been installed.

(4) *Central British Columbia.*—This district will take in the country north of the main line of the Canadian Pacific railway to the Naas

good transportation facilities to the different districts, and, as a consequence, rapid settlement is being effected.

The Pacific Great Eastern railway when completed, will link up the cities of Vancouver and Prince Rupert, on the main line of the Grand Trunk Pacific.

The Chilcotin, Cariboo, and Lillooet districts are essentially suitable for stock-raising purposes. Here, the nutritious bunch grass holds sway, and beef cattle come off these ranges in the fall of the year in prime condition for the butcher without the necessity for any artificial fattening.



HAYING OPERATIONS, LOWER MAINLAND, B.C.

river, which flows into the Pacific Ocean near Prince Rupert, the Pacific terminus of the Grand Trunk Pacific railway, some of the principal districts being Lillooet, Cariboo, Chilcotin, Nechaco, Fraser lake, Ootsa and Francois lake country, Bulkeley valley, Kispiox valley, Kitsumkelum, and Lakelse Lake valleys, and the Naas river country.

This part of the province is rapidly coming to the fore as a great agricultural country. The recent completion of the transcontinental line of the Grand Trunk Pacific and the Canadian Northern railways, and the near completion of the Pacific Great Eastern railway have afforded

The country is open rolling land, with timber here and there. As a rule, irrigation is necessary for growing crops, though experimental work in crop production by dry farming methods has clearly demonstrated that good results can be obtained in many parts where water is not available, and these areas of land will undoubtedly in the near future be cultivated by these methods.

Further north, between Tete Jaune Cache, where the Grand Trunk Pacific and the Canadian Northern railways pass into the province through the portals of the Rocky Mountains, and the city of

Prince Rupert, are many good areas of farming lands, and this part of the province is attracting a considerable settlement at the present time.

The districts mentioned are all well suited for grain growing, stock raising and general mixed farming.

Primarily this is a stock country. Pea-vine and wild grasses grow everywhere, and afford the best of pasturage. The cost of land clearing is light, compared with the Coast districts. Light alder, poplar,

Excessive low temperatures, when they occur, are of short duration.

(5) *Peace River*.—The Peace River is the north-eastern part of the province. Lack of transportation facilities in the past has kept back settlement, but the near completion of the Dunvegan-British Columbia railway has brought in many land-seekers during the past few years, and a considerable settlement has taken place in the Fort St. John and Pouce Coupe districts of the Dominion



PICTURESQUE AND PROFITABLE
This Plot Averaged 103 Bushels per Acre in 1916

and cottonwood, are the predominant trees, with spruce groves here and there. There are many tracts of open land ready for the plough.

The rainfall averages between 20 and 40 inches, according to districts. The summers are fine and warm, with a short but rapid growing season. Summer frosts occasionally cause trouble, but with the settlement and clearing of the land, these frosts will no doubt disappear. The winters are fairly cold, but dry and bracing.

Peace River Block, comprising 3,500,000 acres.

The writer has not yet had an opportunity to visit this part of the province, but all reports would indicate that in these northern confines of the province are vast areas of land which will, in the future, be profitably developed on grain-growing and stock-raising lines.

The shortness of the growing season is counter-balanced by the very rapid growth made during the

hot weather. All grains yield heavy crops, whilst potatoes and other vegetables do well.

In addition, there is a very large extent of land which would be well suited for stock ranging purposes. Winter temperatures are low, but not excessively so.

I have endeavoured, in this short description of the different agricultural areas, to give a general idea of the farming opportunities possessed by each. The predominant fact which stands forth as regards agriculture in British Columbia is that with the exception of the more northerly parts, and certain of the stock-ranging districts, the province is primarily suited for intensive diversified farming on a smaller acreage than is the case in the provinces of the Middle West.

British Columbia is the youngest of the provinces in agriculture, but its opportunities are second to none. Our fertile soils, along with the fine climate which we enjoy, give the right conditions for growing a wide variety of crops to the best advantage.

HORSE-RAISING

A considerable number of horses are bred in the province, principally on the bunch grass lands. Horses raised on these lands have a wonderful stamina and vitality, as the testimony of the officials who made extensive purchases for military purposes would indicate.

On the lower mainland and Vancouver Island, many stock men are raising a fine type of Clydesdale and Shire horses. The cessation of civic and municipal activities during the past few years has naturally militated against the breeding of heavy horses.

DAIRYING

This lucrative phase of farming is followed to a greater or less extent in all districts of the province, the coast districts leading in the quan-

tity of milk and butter produced. Many of the dairy herds of the lower mainland and Vancouver Island would be a credit to any country.

The Holstein is a favourite breed for milk supply, the Jersey, Guernsey and Ayrshire for butter.

The health of our dairy herds is of a high standard, due to the progressive policy adopted by the Government during the past five years, having as its object the eradication of bovine tuberculosis from dairy herds. Testing for this insidious disease is by the intradermal method, and all dairy cattle are at regular periods subjected to the test, and all reactors destroyed, compensation being afforded to the owner.

The average butter production for the British Columbia cow is higher than in any other province in Canada, being 220 lb. butter fat, or the equivalent of 260 lb. butter—a good testimony to the suitability of the province for dairying.

SHEEP

Sheep-raising has not been given the attention which its importance as a profitable phase of the live stock industry would justify, but with the rapid advance in prices of wool and mutton which have lately taken place, stock men are beginning to realize that they have not been alive to their opportunities, and, in all parts of the province, sheep are being kept in increasing numbers by farmers.

Whilst there are certain districts in which sheep may be ranged in considerable numbers, as a rule the sheep industry will be developed as a branch of mixed farming, and small flocks of well-bred sheep on the farm will be the rule.

BEEF CATTLE

The bunch grass lands of the interior are where our prime steers are produced. There are many large cattle owners in the Thompson, Nicola, Princeton, Boundary, Chil-

cotin, Cariboo, and Lillooet districts, though the extensive ranges, originally controlled by a few large cattle owners, are now being cut up by the settlement of preemptors and others, thus putting the industry into the hands of many in the place of few.

The growing of alfalfa and other crops for winter feeding by these settlers will mean that a large number of cattle will be kept, which, of course, is a desirable consummation.

GRAINS

British Columbia cannot be described as a grain-growing country. There is a considerable amount of grain grown, but practically all of it is fed to stock on the farm, very little being exported. Our lands are too expensive for straight grain-growing. Better returns can be secured by feeding to stock the grain that farmers produce. These remarks apply



THE HOLSTEIN IS A FAVOURITE FOR MILK SUPPLY IN BRITISH COLUMBIA

A trip through these stock districts at the time of the fall round-up is a pleasant experience.

Thousands of head of prime fat steers in ideal condition for the block bear eloquent testimony to the nutritive and fattening qualities of the famous bunch grass. The beef industry will also in the near future be greatly extended in the more northerly parts of the province, where conditions are eminently suitable.

to the more settled portions of the province.

Our grain production for the market will in future principally come from the Peace River district, and from some of our dry farming areas in Central British Columbia. Wheat, oats and barley yield abundant crops in all parts of the province.

The average grain yields of British Columbia for the year 1915 were as follows:—

Wheat.....	31	bushels per acre
Oats.....	77½	" "
Barley.....	47	" "

HAY

Timothy, clover, alfalfa and other grasses yield abundant crops. Very little hay is exported, practically all being fed to stock on the farm.

FODDER CROPS

A large quantity of fodder crops is grown, especially in those districts which are principally given over to dairying. Corn is grown in all parts of southern British Columbia for

Thousand-head Kale is also popular amongst dairymen, and provides good succulent feed for the winter months.

ROOTS

All roots yield heavy crops, but are not grown to the extent they should be.

POTATOES

The acreage devoted to potatoes is yearly increasing, and tubers of the finest quality are produced. A considerable export business has been built up during the past few years.



"RED POLLS," LOWER MAINLAND, B.C.

ensilage purposes, and in some parts of central British Columbia also. Silos are rapidly being constructed in all parts of the province, due to a large extent to the demonstration work on silo construction and the growing of corn, that has been carried out during the past few years by the Department of Agriculture.

Alfalfa gives good returns in all the interior districts of southern British Columbia, and in many parts of the northern country. As many as four cuttings per year are made in the best districts.

A careful inspection of all potatoes shipped out of the province is made by officials of the Department, thus ensuring a good standard of quality.

FRUIT

British Columbia has made a name for itself in fruit-growing. Though this industry is of comparatively recent origin, it has made very rapid strides. The value of the fruit crop of 1910 was approximately \$250,000, whilst it is estimated that the value of the crop for the present year will be as high as \$1,700,000.

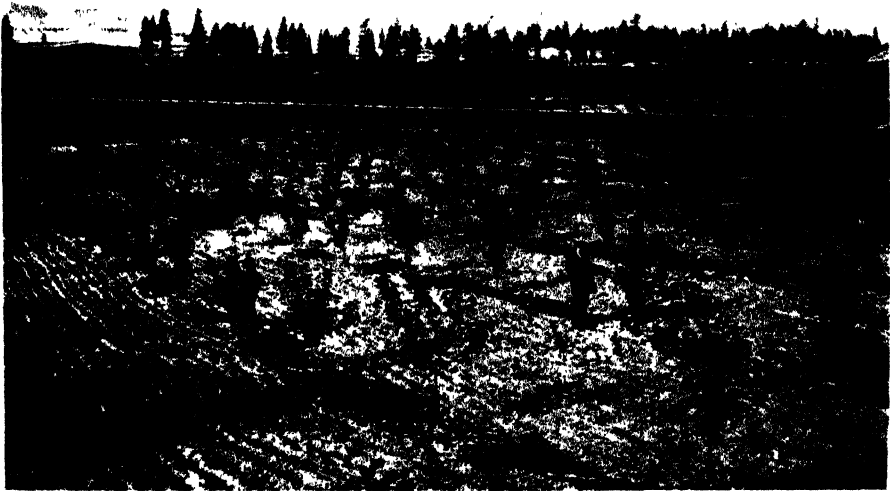
Fruit is successfully grown in all districts of the province, with the exception of some of the more northerly confines. The quality of Vancouver Island strawberries, Lower Mainland raspberries, and the big red apple of the Thompson, Okanagan and Kootenay, is well known to dwellers in the Prairie Provinces, where the larger part of our crop is marketed.

British Columbia secured the gold medal of the Royal Horticultural Society, Vincent Square, London, the blue ribbon of fruit growing, for

the Okanagan and Kootenay countries, and find a ready sale as far east as Winnipeg.

FARM CREDIT

At the session of the Provincial Legislature of 1915, the Agricultural Act, commonly known as the Agricultural Credit Act, was passed. Under the provisions of this Act, authorization is given for the borrowing by the Government of the sum of \$15,000,000 for the purpose of loaning to farmers. The Act



YOUNG ORCHARD, KELOWNA, B.C.

eight consecutive years, against all comers, whilst the province each year captures the leading awards at the Spokane Apple Show.

VEGETABLES

A considerable quantity of vegetables is produced to supply home markets, and, in addition, a large quantity is exported to the Prairie Provinces. Tomatoes, celery, onions, cauliflower, cabbages, potatoes, etc., are shipped in large quantities from the Coast districts,

provides for the appointment of a Board of Commissioners, which has now been made.

Early in the present year, the sum of \$1,000,000 was secured, and the Act put into operation. The money is loaned for certain specific purposes, such as drainage, land clearing, fencing, the erection of farm buildings, purchase of stock, implements, and other purposes, which are calculated to increase agricultural production.

Long dated loans are made on the

amortization plan for periods of 36½ years, 30 years, or 20 years. Short dated loans for a period to be determined in each case at the discretion of the Commission, not less than three years and not to exceed 10 years, may also be made. Such loans need not be amortizable, but may be made on such terms and conditions as the Commission deems fit.

Single seasonal loans may also be made for financing crop operations, etc. Such loans shall be repayable within twelve months from the date of the application.

Before any loan is granted by the Board, a careful valuation of the property is made by the appraisers appointed by the Board, and not more than 60 per cent of the value as determined by the appraiser, calculated on the basis of value and productiveness, when the improvements in respect to which the loan is desired, shall have been effected, can be loaned.

A considerable portion of the money required has already been placed out in loans. The chief drawback under which farmers have laboured in the past has been the impossibility of securing a long-term loan at a reasonable rate of interest for the legitimate development and extension of his farm. This legislation of the Provincial Government meets this difficulty, and it is confidently expected that the successful experience of New Zealand and other countries will be repeated in this province, and that a great stimulus and encouragement will be afforded to agriculture.

CO-OPERATION

That farmers are beginning to realize that effective co-operation, along sound business lines, is necessary for the best success, is plainly evident by the many co-operative societies that have been incorporated under the Agricultural Act. Many co-operative creameries, fruit growers' associations, and similar

organizations, have recently been started, and are doing good work for their supporters in reducing the cost of production by co-operative buying and securing better prices for produce by co-operative selling. This work is in every way encouraged and supported by the Department of Agriculture.

MARKETS

British Columbia farmers can produce goods of the highest quality, but successful marketing is the all-important question. The solution of this problem is gradually being effected by proper organization, through the aid of this Department.

Material assistance is afforded towards the best placing of the farmers' produce by the work of the market commissioners in the prairie provinces and in our Coast markets, who keep the farmer and fruit grower in close touch with market conditions and requirements.

The wealth of the province in minerals, timber and fish is well-known, but we have not sufficiently in the past realized the additional source of national wealth we have in our millions of acres of fertile soil, which are awaiting the hand of man to bring forth the fruits of the earth in abundance. The soil is the basis of national wealth, and permanent prosperity can only come to the country that develops to the fullest extent its agricultural opportunities.

VALUES, BRITISH COLUMBIA AGRICULTURAL PRODUCTION, 1913-15

1913.....	\$26,222,033
1914.....	30,184,100
1915.....	31,127,801

VALUES, AGRICULTURAL IMPORTS FROM OTHER PROVINCES IN CANADA INTO BRITISH COLUMBIA, 1913-15

1913.....	\$12,936,980
1914.....	19,908,455
1915.....	13,493,807

VALUES, AGRICULTURAL PRODUCTS IMPORTED FROM FOREIGN POINTS INTO BRITISH COLUMBIA, 1913-15

1913.....	\$7,133,777
1914.....	5,290,670
1915.....	2,941,163

THE INSPECTION OF NURSERY STOCK

NOVA SCOTIA

BY W. H. BRITTAIN, B.S.A., PROVINCIAL ENTOMOLOGIST

THE nursery business in Nova Scotia is still in its infancy, for, though a number of firms have been growing nursery stock for many years, the local supply has never been equal to the demand, especially in the case of ornamentals. In 1914 over 45,000 fruit trees and a much greater number of ornamentals were imported into the province. A number of our nurserymen have lately been increasing their plantings, and eventually they will doubtless secure a much larger share of the home trade, but since the outbreak of the war the purchase of nursery stock has almost ceased.

LEGISLATION REGARDING THE INSPECTION OF NURSERY STOCK

The provincial statute dealing with the inspection of nurseries and nursery stock is known as the "Injurious Insect Pest and Plant Disease Act, 1911." The provisions of this Act and the regulations issued thereunder, do not make the inspection of nurseries within the province compulsory. In case, however, that certain injurious insects or plant diseases are found in any nursery, no vegetation can be removed from such nursery without the written permission of the Secretary for Agriculture. It further empowers any inspector to destroy any vegetable matter affected with certain specified pests.

Fortunately, the nurseries situated within the province are strikingly free from serious pests, such as the San José scale, and consequently the rigid inspection of home nurseries has never been found to be

necessary in Nova Scotia. The chief efforts of the inspectors have been directed toward the prevention of the importation of injurious pests on nursery stock coming in from points outside the province.

According to the provisions of the Act, no nursery stock originating in other provinces of Canada, or in the United States of America, can enter the province except through the ports of Digby and Truro at certain specified periods. Furthermore, all such stock must be accompanied by a certificate stating that the nursery in which the stock was grown had been inspected and found to be free from San José scale and other injurious pests. By an agreement with the Dominion Government, Digby and Truro have been declared ports of entry, under the Dominion Act, and nursery stock that has originated in the United States of America is inspected and fumigated by provincial officials.

The following are the principal insects and diseases that have been declared to be subject to the Act: The San José scale (*Aspidiotus perniciosus*); the gypsy moth (*Porthetria dispar*); the brown-tail moth (*Euproctis chrysorrhoea*); the Powdery Scab of potatoes (*Spongospora subterranea*); Apple Canker (*Nectria ditissima*).

ADMINISTRATION OF THE ACT

The administration of the Act is under the immediate supervision of the provincial entomologist, appointed by the Governor-in-council, who is assisted by one assistant entomologist and a staff of inspectors. The inspectors are all grad-

uates of the provincial Agricultural College, and are employed, for the most part, throughout the entire year. During the importation season they are engaged in the inspection and fumigation of nursery stock, during the summer months in field inspection, and, in the winter, they are employed collecting the winter nests of the brown-tail moth. Since the beginning of this work, the chief fruit-growing sections and

neighbouring counties have been covered by the inspectors, and all the orchards carefully examined. As a result the San José scale, which had been introduced on imported stock, and widely distributed, has been practically wiped out. By a continuation of the rigid inspection of all in-coming stock, it is hoped that this condition of affairs will be maintained.

ONTARIO

BY L. CAESAR, B.A., B.S.A., PROVINCIAL ENTOMOLOGIST

EXTENT OF THE NURSERY INDUSTRY

THERE are over fifty nurseries in Ontario, not taking into account those that grow only such plants as strawberries, bulbs, tubers, herbaceous perennials and bedding plants. There is of course

fact that over 2,000,000 plants were examined this year by the nursery inspectors. Of these plants considerably more than 1,000,000 consisted of the various kinds of fruit trees—apples, pears, plums, cherries and peaches, and the remainder of deciduous ornamental trees, orna-



A BLOCK OF YEARLING APPLE TREES IN THE NIAGARA PENINSULA

a great difference in the size of these nurseries for they vary all the way from the very small ones with only one or two acres of stock to the largest with 100 acres and upwards. The extent of the industry can, however, be better judged from the

mental shrubs and bush fruits, such as currants and gooseberries.

SITUATION OF THE NURSERIES

The great mass of the industry is centred in the counties of Went-

worth, Lincoln and Welland, where the climate is specially favourable for the production of tender fruit trees, such as peaches, and other tender plants. The rest of the nurseries are widely distributed throughout the province.

REGULATIONS IN REGARD TO INSPECTION

The regulations require the inspection of every nursery at least once each year before September 15th for San José scale and Pear Blight, and the breaking down and prompt removal and burning of any infested tree. Moreover with a view to securing clean surroundings, all trees subject to infection not in the nursery rows, whether within the nursery grounds or within a radius of one-half mile of the nursery, have also to be inspected early in the season and, when infested, the owners are notified to treat them effectively in accordance with the instructions of the Provincial Entomologist, or cut them down and burn them within ten days after such notice is given.

The Provincial Entomologist has charge of all inspection work. He is assisted by the provincial inspector appointed under the Fruit Pest

Act, and by two permanent inspectors. In addition to these he employs as many extra inspectors, chiefly Agricultural College students in entomology or horticulture as are required to complete the work within the time limit. This inspection begins in May and ends in September as said above. The expense of inspection is borne by the province.

FUMIGATION

In addition to the inspection, all nursery stock, except evergreens, strawberry plants, bulbs, tubers, herbaceous perennials and bedding plants, no matter whether there is any San José scale in the district or not, has to be fumigated for 45 minutes with hydrocyanic acid gas before shipping. Fumigation houses are tested before being used to see that they are air tight. In districts where San José scale is known to exist, the fumigation is done by an inspector appointed by the Provincial Entomologist and responsible solely to him. In other districts known to be free from San José scale each nurseryman is required to do his own fumigation in accordance with instructions furnished him by the Provincial Entomologist.

BRITISH COLUMBIA

BY R. M. WINSLOW, B.S.A., PROVINCIAL HORTICULTURIST AND INSPECTOR OF FRUIT PESTS

IN the present season, 1916, there are some 24 nurseries in the province; each of these is growing fruit trees, small fruit bushes, and plants and ornamentals. There are doubtless others, on a very small scale, not recorded. The production for sale, this fall and next spring, is about 200,000 fruit trees, 115,000 small fruit bushes; ornamentals and roses, 50,000. The fruit trees are mostly one-year-old tops, but there is quite a percentage of 2 and 3-year-olds because of the slow demand the

last 2 years.

The industry is a much smaller one than 3 or 4 years ago owing to a great falling off in sales. It is reported that the present demand shows an improvement as against a year ago, and the number of seedling trees newly budded or for grafting indicates an increase next year.

The nurseries are scattered through Southern British Columbia, about one-half of the production being on the Coast and Vancouver Island, the other half in the southern interior.

INSPECTION LEGISLATION

The following sections from the Agricultural Act, 1915, show the restrictions made to protect the purchaser against the sale of unsatisfactory stock:—

"142. No person shall sell within the province, as principal, agent, or otherwise, fruit-trees, plants, or nursery stock without the license therefor by this Part of this Act required.

"143. Any person may obtain from the Minister a license to sell within the province fruit-trees, plants, and nursery stock upon payment of the license fee hereinafter provided, and upon depositing with the Minister a certified cheque drawn on any chartered bank in the province for a sum not exceeding two thousand dollars, or upon filing with the said Minister a bond to His Majesty, satisfactory to said Minister, in a penal sum not exceeding two thousand dollars, conditional that the obligor shall pay all damages that may be occasioned to any person in the province through the sale to such person by the licensee, his agent or agents, of any infected fruit-trees, plants, or nursery stock, or of any fruit-trees, plants, or nursery stock that are not of the variety and character represented by the licensee, his agent or agents, at the time of sale.

"144. Any person in this province who shall sustain damage through the sale to him by the licensee, his agent or agents, of any infected fruit-trees, plants, or nursery stock, or of any fruit-trees, plants, or nursery stock that are not of the variety and character represented by the licensee, his agent or agents, at the time of sale, shall have a right of action in the courts of this province upon said bond for such damages, notwithstanding the provisions of any contract or agreement to the contrary.

"145. A licence under section 143 hereof shall not be for a longer period than one year, and shall expire on the thirty-first day of December of the year in which it is issued.

"146. The fee for such a licence shall be five dollars for nurserymen and five dollars for each agent.

"147. Any licence granted under the foregoing sections may be suspended or cancelled by the Minister, upon evidence satisfactory to the Minister that the holder of the licence has sold infected fruit-trees, plants, or nursery stock, that were not of the variety or character represented at the time of sale.

"148. Any person who shall sell or import for sale any fruit-trees, plants, or nursery stock, without having obtained a

licence under this Act, shall be liable to a fine not exceeding fifty dollars and costs, upon summary conviction before any police magistrate, stipendiary magistrate, or justice of the peace.

"150. Nothing contained in sections 142 to 148, both inclusive, of this Act shall be held to apply to dealings in:

- "(a) Greenhouse plants, including roses.
- "(b) Herbaceous bedding plants.
- "(c) Herbaceous perennials.
- "(d) Bulbs and tubers."

The above sections have been in effect for a number of years, but were consolidated into the Agricultural Act a year ago.

The \$2,000 Bond required under the Act makes an annual charge of \$20 per nursery. A number of the smaller concerns claim inability to meet this charge on their comparatively small production, and the Department is now considering a bond of different character to meet this condition.

The following section of the Horticultural Regulations, issued under the Agricultural Act, deals with the labelling of shipments:—

"Every package of nursery stock or plants shipped or transported within the province shall bear securely attached thereto a label stating the nature and quantity of the contents of the package, and the names of the shipper and the consignee of the nursery stock or plants, and the locality where the same were grown. Every person who ships or causes any package of nursery stock or plants to be shipped or transported in violation of the provisions of this section shall be guilty of an offence against these regulations."

Part VII of the Agricultural Act, creating a Board of Horticulture, and investing certain powers in the Board and in the Inspector of Fruit Pests, gives wide powers as to the inspection, disinfection, treatment and destruction of all infected stock. These powers are also extended to stock which has been damaged by frost or otherwise injured.

The inspection service was transferred to the office of the Provincial Horticulturist April 1st., 1916. Since that time the inspection of

nurseries and nursery stock has been carried out by the Assistant Horticulturists who are made Inspectors of Fruit Pests for the purpose.

A first inspection is made in July. At that time the inspector reports to the Chief Inspector of Fruit Pests on the amount of stock being grown, its general condition, the presence of pests and diseases and the measures being adopted to control or eradicate them.

A second inspection is made at the time the stock is being dug and prepared for fall shipment, or for storing; especial attention is given in this inspection to root diseases, woolly aphis, borers, frost injury, anthracnose, etc. The inspectors are instructed to secure, as far as possible, the culling out and destruction of all diseased, infected or injured stock, so that a Release certificate may be granted covering the whole product of the nursery.

Should it prove impracticable to issue a Release certificate at the time of digging, inspection during the fall and spring shipping seasons is made. This is more or less continuous through the shipping season and Release certificates are then only issued on each lot of stock inspected and passed while in process of packing.

The nurseries of the province have never, so far, shown infection by San José Scale and this immunity apparently continues to exist, enabling the inspection staff to devote their attention to the other and comparatively less important insects and diseases.

The inspection makes it practically possible to guarantee to the fruit growers of the province stock clean and free from all detectable troubles.

No fees are charged.

NEW BRUNSWICK

AGRICULTURAL LEGISLATION

BY J. B. DAGGETT, SECRETARY FOR AGRICULTURE

THE New Brunswick Legislature at its last session, held in March, 1916, passed but little agricultural legislation.

The Act of 1915, relating to the control of bees and inspection of apiaries, was amended. The amendment did not materially alter the Act, but simplified the method of enforcement.

An Act was passed amending the Act providing for the inspection and registration of stallions. By the amendment, the Act, which was to have come into force in May, 1916, does not come into force until May, 1917. It also provided that on and after the first day of May, 1919, no certificate of enrolment shall be issued for a grade stallion, and no person travelling an unenrolled stal-

lion shall have route bills or breeding cards printed or posted.

An Act was also passed to provide for settlements after the war. By this Act the duties of the members of the Farm Settlement Board were enlarged. An Advisory Settlement Board was provided for. Power to borrow money was also granted for the purposes of farm settlement. This Act is intended to provide for soldiers who may desire to settle upon the land after the war, the carrying out of the Act to be under the direction of the Minister of Agriculture.

APPROPRIATIONS FOR AGRICULTURE

The appropriations for the year 1916-17, authorized by law and voted by the Legislature, are as follows:—

Civil Government, Travelling Expenses and Contingencies.....	\$10,358.34
Grants to Societies.....	17,000.00
Butter and Cheese Factories.....	500.00
Dairy School.....	1,000.00
Maritime Stock Breeders' Association.....	800.00
Encouragement of Horticulture.....	1,500.00
Encouragement of Stock-raising and Dairying.....	5,000.00
Bonus to Mud Dredges for Fertilizer.....	500.00
Farm Settlement Board.....	1,500.00
Encouragement of Poultry-raising.....	1,500.00
Standing Crop Competitions and Seed Fairs.....	3,000.00
Miscellaneous, including Insurance Exhibition Buildings and Representative in Cuba.....	2,500.00
Exhibitions.....	10,000.00
Brown-tail Moth and Other Insects, Extermination of.....	3,650.00
Limerock Crusher and Power.....	500.00
Bonus to Wheat Mills.....	2,500.00
Total.....	\$61,808.34

NOTES

There has been added to the New Brunswick staff Mr. Ora C. Hicks, B.S.A., a graduate of Macdonald College. Mr. Hicks is connected with the Soils and Crop division of the Department. Since his appointment in July Mr. Hicks has been giving special attention to extending the growing of clover seed in New Brunswick.

The Honourable J. A. Murray has gone to England accompanied by Mr. F. W. Sumner, Agent General for New Brunswick in the British Isles. These gentlemen will study the immigration problem with a view to preparing to meet the immigration situation which may develop after the war.

QUEBEC

THE SCHOOL GARDENS' ASSOCIATION OF AMERICA

BY JEAN-CHARLES MAGNAN, SUPERINTENDENT OF GARDENS

THE annual convention of the School Gardens' Association of America was held in New York City. A large number of members of the association and of representatives from other countries were present. The convention was extremely successful and most helpful to all. Most of the questions concerning school gardens and the elementary teaching of agriculture were treated by experts and thoroughly discussed by the delegates.

Special interest in Canadian school gardens was taken at this convention. The kind words of the

president, Mr. Kilpatrick, for the representatives of Canadian provinces, show clearly that the directors of the association earnestly desire to promote school garden work in all the Canadian provinces. It would be necessary, in the interest of our work, that all those who are called upon to supervise the elementary teaching of agriculture in the provinces, remain in constant touch with the officers of the association. The correspondence exchanged with Messrs. Kilpatrick of New York and Philadelphia, Mr. S. B. McCready, formerly of Prince Edward Island, and others, has kept us in touch with the

progress made and the new methods successfully adopted by our neighbours.

The president of the School Gardens' Association of America, Mr. Van Evrie Kilpatrick, recently made an observation tour through Canada. He visited the members of the Maritime Provinces' Association, and noted the good work done by them. He also visited Quebec and St. Casimir. His encouraging words and useful hints were highly appreciated by our school children. We are very glad indeed, that this distinguished visitor had the happy thought to come to Canada. This mark of interest in the work of Canadian members of the association will not fail to create new bonds of sympathy, so necessary for the future progress of the cause of agricultural education among the

children of the Dominion of Canada.

In concluding, we shall sum up in a few words the object of the association. The School Gardens' Association, which now includes 4,000 members, has the following programme: (1) To impress upon the parents the great value of school gardens as regards the teaching of children; (2) to develop and encourage throughout America the teaching of agriculture in rural schools; (3) to prepare and distribute among the members, pamphlets and circulars regarding school gardens; (4) to conduct experiments in various districts regarding the elementary teaching of agriculture and to gather information on the methods adopted in each district; (5) to encourage the establishment of school gardens in America.

ONTARIO

THE LATE HONOURABLE J. S. DUFF, MINISTER OF AGRICULTURE

THE Honourable James Stoddart Duff, Minister of Agriculture for the province of Ontario, died November 17th. The Honourable Mr. Duff was born on June 20th, 1856, on the farm near Cookstown, Dufferin County, which was his home continuously through life. He was the son of John and Eliza Jane Duff. His father came from the north of Ireland in 1825. He was educated in the local schools and at Collingwood Collegiate Institute. He was elected a councillor for the township of Essa in 1888 and subsequently became Deputy Reeve. He was returned to the provincial legislature for West Simcoe in 1898 and retained the seat until his death. In 1908, Mr. Duff succeeded the Hon. Nelson Monteith as Minister of Agriculture in the cabinet of the late Sir James Whitney and remained in office during the premiership of the Hon. W. H. Hearst to the



THE LATE HONOURABLE J. S. DUFF

end. He was a thoroughly practical agriculturist and was widely and highly esteemed both for his personality and his earnest devotion to his duties. He is survived by his widow, one son, Lieutenant Edward Duff, and two daughters, his oldest son, Private Grant Clark Duff, having been killed on the battlefield in the month of November. During the Honourable Mr. Duff's regime as

Minister of Agriculture much of the legislation administered by his Department was amended, and the following important measures enacted: The Ontario Milk Act, The Stallion Enrolment Act, The Dairy Standards Act, as well as legislation and organization to carry out the provisions of THE AGRICULTURAL INSTRUCTION ACT.

SASKATCHEWAN

PROTECTION OF PRAIRIE FOWL

JUST before the opening of the prairie chicken shooting season, the Game Branch of the Department of Agriculture issued an appeal to the sportsmen of the province to spare the chicken this year, in view of their increasing scarcity.

During the year 1915, chicken and partridge were so scarce that the legislature shortened the chicken shooting season by two weeks, and gave entire protection to the partridge. This year, according to reports received by the Game Branch, chicken were even scarcer than in 1915. It has been suggested that The Game Act should be amended to prohibit the hunting of prairie chicken for a period of years, but this suggestion cannot be considered until the next session of the legislature.

The economical value of the prairie chicken is too often overlooked. It is a scientific fact that birds of the grouse family destroy myriads of injurious insects, which, if unchecked, would play havoc with the crops and make mighty inroads upon the farmers' profits.

The Bob-white quail, which belongs to the same order as the grouse, is described in connection with the

destruction of insects and weed seeds as, "The most marvelous engine of destruction ever put together of flesh and blood." The grouse, whose habits are very similar to those of the quail, might justly be classed as an agency of equal usefulness, living as they do chiefly upon insects during the breeding season and principally upon a diet of weed seeds in the fall and winter.

The wheat crop is one that suffers most from the attack of insects, the chinch-bug, the hessian-fly and the wheat plant lice at times doing damage that almost amounts to a calamity. The crops of Saskatchewan have not yet suffered to an alarming extent by the ravages of insects, but in the light of present-day knowledge are we not justified in saying that the grouse and other useful birds are responsible in a large degree for the absence of these pests. The hessian-fly played havoc with the wheat crops in Indiana and Ohio in 1900, over two million acres of wheat being ruined. This fly has been found on a few Saskatchewan farms, where it has done considerable damage, and any factor that tends to hold this and other pests in check is deserving of more than passing interest.

EXPORTING BUTTER TO ENGLAND

ON October 24th a carload of Government creamery butter was shipped from Regina to a buyer in Manchester, England. The three provinces, Manitoba, Saskatchewan and Alberta, contributed to the car in about equal proportions, and the negotiations, both between the other provinces and the buyer, were conducted by Mr. W. A. Wilson, Dairy Commissioner of Saskatchewan.

This is the first time that a consignment of Government creamery butter has been shipped from Western Canada to the old country

market, and, as the quality is No. 1, it is hoped that the filling of this sample order will be the forerunner of a large trade in this direction. It will be interesting to watch results of this experiment.

This demonstrates that the Saskatchewan dairy policy and organization is capable of opening and developing new markets without the intervention of the middleman. This insures the highest possible return to the producer, less expense in selling, a quicker settlement, and all the obvious advantages of co-operative production and marketing.

DRY FARMING CONGRESS

SASKATCHEWAN farming products have again been successful at the Dry Farming Exposition held at El Paso, Texas. The exhibit, while smaller than in other years, was of very high quality.

In the competitions, open alike to the products of Dry Farming districts and of irrigated areas, Saskatchewan won sweepstakes in wheat, barley, rye and flax, as well as first prizes for wheat, barley, rye and field peas. In the exhibits of sheaves many first and second prizes were won. The exhibits in this class included alfalfa, brome grass, sweet clover, orchard grass, timothy, hungarian millet and western rye grass. First prizes were also won on Carmen potatoes, Early Ohio potatoes, parsnips, table beets, carrots and rutabagas.

In the class for grains grown under Dry Farming conditions Saskatchewan won first, second and third prizes on spring wheat, third prize on winter wheat, second and third prizes on oats; first and second on barley; first on rye and first and second on potatoes.

Seager Wheeler, of Rosthern, Sask., who has a reputation as a consistent prize winner, was again successful, winning first prize and sweepstakes for best half bushel of Hard Red spring wheat, as well as a special prize on his collection of tame grasses and clovers. In the women's section of the exposition Mrs. I. R. Milne, of Qu'Appelle, Sask., won first and second prizes on canned beans, first on canned corn and first on collection of canned vegetables.

BRITISH COLUMBIA

AGRICULTURAL CREDIT

THE "Agricultural Act" of British Columbia, passed in March, 1915, authorizing the borrowing of money to be lent to farmers to make improvements in their farms, purchase live stock and other things, is now in active operation. The provisions of this measure were explained in THE AGRICULTURAL GAZETTE for May 1915. According to *The Agricultural Journal*, published by the British Columbia Department of Agriculture, 144 loans aggregating \$234,430 had been made, 142 loans aggregating \$344,405 had been refused and 121 loans aggregating \$372,450 desired to pay off existing mortgages, are held over for further consideration. The following table deals with the loans granted for terms varying from three to thirty-six and a half years:

Loans	Amount	Total
5 "	\$ 250	\$ 1,250
2 "	300	600
21 "	500	10,500
2 "	600	1,200
3 "	750	2,250
2 "	800	1,600
2 "	850	1,700
26 "	1,000	26,000
4 "	1,200	4,800
12 "	1,250	15,000
1 "	1,300	1,300
16 "	1,500	24,000
4 "	1,800	7,200
16 "	2,000	32,000
1 "	2,280	2,280
8 "	2,500	20,000
4 "	3,000	12,000
2 "	3,500	7,000
4 "	4,000	16,000
1 "	4,250	4,250
6 "	5,000	30,000
1 "	5,500	5,500
1 "	8,000	8,000
144		\$234,430

The Agricultural Credit Commission which administers this Act has five appraisers at work in various parts of the province.

FIFTH INTERNATIONAL EGG-LAYING CONTEST, VICTORIA

BY J. R. TERRY, DIRECTOR, DEPARTMENT OF AGRICULTURE, VICTORIA

SUMMARY OF RESULTS

Duration of contest (from October to September, 1916)	months	11
Number of pens		40
Number of birds		240
Number of eggs laid		36,382
Value of eggs laid		\$1,030.88
Cost of feeding		\$436.45
Profits over cost of feeding		\$594.43
Average price of eggs per dozen	Cents	24
Average cost to produce dozen eggs	"	14.3
Average number of eggs laid per pen		909.5
Average number of eggs laid per bird		151.5
Average cost of food per pen (6 birds)		\$10.91
Average cost of food per bird		\$1.81
Profit over cost of feed per pen		\$14.86
Profit over cost of feed per bird		\$2.47
Eggs laid by winning pen, Class 1		1,103
Average per bird, winning pen, Class 2		183.8
Eggs laid by winning pen, Class 2		1,126
Average per bird, winning pen, Class 2		187.6

PART III

Rural Science

THE TEACHING OF HOUSEHOLD SCIENCE

NOVA SCOTIA

DEPARTMENT OF EDUCATION

SUPPLIED BY A. H. MACKAY, SUPERINTENDENT OF EDUCATION

ADVANCED courses in domestic science instruction are provided at the Provincial Normal College, Truro. These courses have been established by the Board of School Commissioners for Truro, in affiliation with the Provincial Normal College, and with the approval of the Council of Public Instruction, for the purpose of furnishing thorough training to those who wish to become teachers of domestic science.

Candidates for these courses must be at least 18 years of age and those who wish to become teachers in the public schools of the province must hold a class B. licence or a high school certificate of grade eleven, with a teacher's pass in the science subjects of grades nine, ten and eleven, or their equivalents.

COURSES OF STUDY

The following are the courses of study offered:—

Food and cooking: demonstration and practice.—Composition and nutritive value of foods; fundamental principles and processes of cookery; production of food materials, such as dairy products, cereals, etc., manipulation of foods, such as flour, spices, etc., food adulteration; preservation of foods; cookery for invalids and children; table laying; planning, cooking, and serving of meals, etc.

Dietetics.—Special attention to study of laws of nutrition, digestion; selection of foods for children, for adults, for the sick and the convalescent.

Household chemistry and bacteriology.—This course will include the study of principal food products, such as sugar, starches, fats, proteids, salts, special attention being given to the changes which these bodies undergo in cooking and the tests applied to them; fermentation, putrefaction, and their prevention by chemical means; sterilization, testing of milk, butter, cheese, water, etc.; corrosive action of food constituents, acids, etc., on utensils; chemistry of fuels and illuminants; lectures and laboratory work illustrating the nature of bacteria, methods of isolation and recognition of species and of the part which they play in nature; bacteria of air, ice, milk, and foods generally; methods of sterilization and disinfection; relation of bacteria to disease.

Physiology, first aid and home nursing.—Lectures and demonstrations. Anatomical and physiological outline, care of the body, bandages and bandaging, emergency cases and their immediate treatment, some of the common forms of poisoning and their antidotes, general care of the sick.

Hygiene and home sanitation.—General principles of hygiene, prevention of the spread of contagious diseases, quarantine, etc., water supply, disposal of waste, heating, lighting, ventilation, healthful surroundings, etc.

Laundry, textiles.—Water, soap, blueing, starch, irons, etc., removal of stains, care and laundering of table and wearing linens, white and coloured prints, muslins, laces, woollens.

Needlework.—A study of textile fabrics; the various handstitches; cutting-out and fitting; the use of the sewing machine.

Household economics, including marketing and accounts. Care of silver, glass, china; care of furniture, method in housekeeping, cost of living, buying of foods, keeping of accounts, domestic service, etc.

Students in training will be required to spend part of their time in observing methods of teaching and in actual practice as assistants in the domestic science department of the Truro public schools.

The school is open free of cost to all who hold a first class licence or a teacher's pass on the Provincial High School course of grade eleven and on the sciences of grades nine, ten, and eleven. Others will be admitted by special arrangement.

The course for diploma continues through two years concurrently with the Normal College classes. During the first year, the candidate follows, in the main, the training courses of the "B" class of the Normal College, specializing during the latter half of the term in branches of domestic science. In the second year the work is entirely technical, and the graduate is eligible for both the first rank diploma of the Normal College and the diploma in domestic science.

DEPARTMENT OF AGRICULTURE

BY M. CUMMING, B.A., B.S.A., SECRETARY FOR AGRICULTURE

WE had just completed our building with equipment for the teaching of domestic science at the College of Agriculture, Truro, N.S., shortly after the war broke out, and we had at the same time adopted a policy not involving much extension during these strenuous war times. We, therefore, considered it wise to hold back developments which we had planned in connection with classes in domestic science.

For this reason there will not be put on a regular graduate course in domestic science at the college this year, but there will be held a two weeks' short course in the month of

January, and provided a sufficient number of applications are received, a six weeks' short course afterwards.

In addition to the work at the college our Domestic Science Department is planning to conduct, in several centres of the province, short courses of about one week's duration each. A beginning along this line was made in one of our demonstration buildings at Lawrencetown, N.S., last June, and so marked was the success that it is proposed to develop it at a later date, probably when the war is over; it is planned to develop our domestic science work on a much more extensive scale.

ONTARIO

HOUSEHOLD SCIENCE AT TORONTO UNIVERSITY

IN this province Household Science courses begin in the Kindergarten and are continued, as outlined in Vol. II, page 365, of THE AGRICULTURAL GAZETTE, throughout all the forms of the public and separate schools and the lower schools of the high and continuation schools, the courses in the fifth forms and the lower schools being organized in accordance with

local conditions. Instruction classes and courses for training teachers are also held by the University of Toronto and at the Ontario Agricultural College, the work at the latter being conducted by the Macdonald Institute, as described in a succeeding paper in this issue of THE AGRICULTURAL GAZETTE by Miss Mary M. Watson, Directors of the Home Economics Department.

**CERTIFICATE IN ELEMENTARY
HOUSEHOLD SCIENCE**

At the University the work set out for the certificate in Elementary Household Science is covered in two consecutive summer sessions in two parts, which have to be taken up in the prescribed order. The course in part II was given this year, and the course in part I will be given next year. In part II the course comprises study in foods and their preparation, special attention being given to food work applicable to rural schools. As to part I, the regulations give the courses of study as sewing and household management. Regarding sewing, it is provided that the course prescribed for the Normal schools shall be continued with the application of the stitches to useful articles. The lessons in household management include cleansing agents and methods of using them, with practical applications to the care of the school room and its equipment, planning, furnishing, heating, lighting, ventilating and disposing of waste, treatment of every day injuries, simple bandaging, etc.

EXAMINATIONS

Regarding examinations, it is ordered (1) that the standing of the candidate shall be determined by the marks for the sessional record and the final written examination combined; (2) that the sessional record shall consist of the oral and written tests and practical work throughout the session; (3) that the subjects of the examination shall be foods and food preparation, maximum marks 200, and household management and sewing, maximum for each 100; (4) that for each subject the maximum marks for the sessional record and final written examination shall be equal, and (5) that the percentage of requirements to pass shall be forty per cent of the sessional work in each subject, and forty per cent of the total marks for each subject, and

sixty per cent of the aggregate for the three subjects.

**ORDINARY CERTIFICATE IN
HOUSEHOLD SCIENCE**

The regulation dealing with this section says: (1) that the courses of study for an ordinary certificate in household science are covered in one college session at the Faculty of Education, University of Toronto; (2) that regular and punctual attendance is compulsory, and (3) that students who in the opinion of the staff are unduly deficient in scholarship, or whose conduct or progress or general health is unsatisfactory, may be dismissed from attendance any time during the session.

FEES

An annual fee of \$25 is required for tuition, laboratory supplies, physical culture, and the use of the library of the department. At the beginning of the session a deposit of \$2 is required in each of the departments of household science and elementary applied chemistry, which is returned, less any damage to equipment that may have been done. If a student who has been granted an ordinary certificate teaches the subject of household science in the provincial school system during the year following the examination the fee of \$25 is returned.

COURSES OF STUDY

The courses of study for an ordinary certificate are: food and food preparations, household management and housecraft, sewing, elementary applied chemistry, and methods in household science. The course in elementary applied chemistry deals with the chemical nature of foods and a short series of lectures is given on certain principles of organic chemistry and of biochemistry, necessary for the understanding of the composition of foods and of their physiological value, as well

as elementary lectures and laboratory work on the more important aspects of the composition of food and the changes which they undergo in digestion, putrefaction, etc. Students are expected to have a knowledge of elementary organic chemistry.

REQUIREMENTS FOR SUCCESS

Candidates for the ordinary certificate are required to pass in each of parts I and II under conditions which provide that 400 marks can be given for foods and food preparations and 200 each for household management, sewing and elementary applied chemistry. The standing of candidates is determined by the sessional records and the final written examinations, to each of which half the maximum value of the marks assigned to each subject is allotted. Two papers each of foods and food preparation and household management and one of sewing and elementary applied chemistry are required. The pass standard in part I is forty per cent of the marks assigned to the sessional records in each subject, and forty per cent of the aggregate marks for each subject, and sixty per cent of the aggregate of the marks in the part.

The standing of the candidates in part II is determined wholly by the sessional records. For this purpose the maximum value assigned to practice lessons is 300, and to observation lessons 100. The pass standard is 60 per cent of the aggregate marks. Candidates who fail in part II, or who do not obtain 40 per cent of the marks assigned to the sessional records in each subject of part I, must repeat the session if they wish to qualify for the ordinary certificate. Candidates who fail in part I, but obtain the necessary 40 per cent in the sessional work of each subject, may qualify in any subsequent year without attending again by repeating the final written examinations and complying with

the pass standards. A candidate who takes the course and passes the examinations is entitled to an interim ordinary household science certificate which will be made permanent on the report of an inspector concerned that the holder thereof has taught household science successfully for at least two years.

DURATION OF COURSES

The calendar of the University provides for:

1. *History of Home Life*: A course of lectures one hour a week throughout the session.

2. *Household Management*: A course of six hours a week throughout the session. This includes (a) a study of metals, woods, fabrics, etc., used in the home, and the principles underlying their care, (b) the house, (c) the home care of the sick.

3. *Foods and Food Values*: A course of ten hours a week throughout the session—lectures and laboratory work.

4. *Economics of the Household*: A lecture course of two hours a week throughout the session. The course includes the economics of spending, the division of the income, etc.

5. *Dietetics*: A lecture course of two hours a week throughout the session. Methods of investigating the kind and amount of food required under varying conditions are discussed. Practical application of this knowledge is made in the construction of dietaries for different classes of people.

6. *An Advanced Laboratory Course* of six hours a week throughout the session. This includes practice in marketing and in preparing and serving meals and special diets. Each student is given the opportunity to investigate special problems bearing on her work.

7. *Household Science for General Course Students*: A course of six hours' work a week throughout the session—lectures and laboratory work.

8. *Household Science for General Course Students*: A course of two hours' lecture and four hours' laboratory work a week throughout the session.

9. *A One-year Course* for the training of candidates for ordinary certificates in household science. The course is open to teachers who hold professional certificates.

Under certain conditions, occasional students may be admitted to Courses 7 and 8.

Opportunities are offered in the

laboratories to graduate students who desire to engage in research work.

A deposit of three dollars (\$3.00) is required of each student taking laboratory courses. This amount, minus the cost of equipment and

apparatus destroyed, is returned at the end of the year. In the food laboratories students are required to wear plain white aprons, in household management laboratories dark ones can be worn.

MACDONALD INSTITUTE, GUELPH

BY MISS MARY M. WATSON, DIRECTOR, HOME ECONOMICS DEPARTMENT

THE Home Economics Department of the Ontario Agricultural College is housed in Macdonald Institute, which was built and equipped by Sir William Macdonald in 1903. Two objects are held in view,—one to help the young women of the country towards good housekeeping in their own homes, in the same way as the college helps the young farmer towards better farming; the other to provide professional training for domestic science teachers and institution housekeepers.

Three non-professional courses are offered, each occupying the full time of the students. The short course with an entrance requirement of ordinary public school training, provides a good deal of practical work in cookery, laundrying, housework and one branch of sewing; some elementary lectures on food, sanitation and home nursing; and two weekly lessons in either horticulture, dairywork or millinery. It is thorough as far as it goes, and has always been very popular. No examinations are held and no certificates awarded. Students get out of it just what they work for, but the majority work steadily and well.

THE VARIOUS COURSES

The Homemaker course occupies one school year, and High School Entrance is required for admission. This is an enlargement of the short course, with more sewing, and the additional work is physiology, household administration and English, and some practice in actual housekeeping. This is especially

satisfactory for the young girl who has had little to do with household affairs, and for the older girl who left school early. It does not turn out experienced housekeepers, but most students develop a keen interest in the work and secure a good foundation to build upon. A diploma is awarded to those passing the examinations.

The Associate course, leading to the Associate diploma, is a recently added course planned especially for the girl desirous of preparing for life in the country. It requires two years of high school work and a year's work at home, or junior matriculation, for entrance, and demands a higher grade of work. It occupies two years. The first year's work is much the same as in the Normal course, but the second year's work applies to home rather than school problems, and cultivates a wider outlook than is possible with the shorter courses.

The Normal course is a two-year professional course leading to a Domestic Science teacher's certificate. Ontario Entrance to Normal, Junior Leaving, and First, Second and Third professional teacher's certificates are accepted for entrance, but limited accommodation enables the College to give preference to those candidates with the best housekeeping and teaching experience. Graduates of this course are occupying responsible teaching positions in every province in Canada, a few are hospital dietitians, and some are occupied with women's institute work.

Formerly a one-year Normal course was carried on. It was open only to experienced first and second-class

professional teachers and was accepted as satisfactory preparation for public school domestic science teaching. This course was dropped in 1915.

The Housekeeper course is a two-year professional course in preparation for institution housekeeping. It is open to women who are over twenty-five, and who have had good home experience of housekeeping. Most of the first year's work is taken with the Normal class, but the second year specializes on institution problems. The housekeeping of Macdonald Institute, Macdonald Hall, (the women's residence), the men's dining hall and the maids' dormitory is closely studied and valuable training and practice are secured through the co-operation of those in charge. Institutions are rapidly discovering the value of trained housekeepers, and there is a lively demand for capable graduates of this course, with salaries quite equal to those of Normal graduates.

FARMERS' DAUGHTERS GIVEN PREFERENCE

Farmers' daughters are given preference in the non-professional work, but candidates for professional courses are held on waiting lists until June, when all are carefully considered and the best of them accepted. This policy works very well, since for several years past many more applications have been received than could be accepted.

Macdonald Institute recently conducted an experiment to discover if it is feasible to carry on full-time

courses in outside places for the girls who cannot leave home to come to Guelph. A village schoolroom was fully equipped for the practical work and lectures of the regular short course in domestic science. The local women's institute scoured the countryside for the class, and secured twenty-two, who registered for the first Macdonald Institute branch and paid the regular tuition fee of fifteen dollars. Most of them drove in from homes in the country, and the attendance for the whole twelve weeks was remarkable. The girls of course missed the residence life of the College, but, since most of them could not leave home, that loss was inconsiderable. The experiment was so successful the College is now offering similar Macdonald Institute branches to other places upon the easiest conditions. The College undertakes to furnish and install teacher, equipment and everything necessary, provided some local organization will secure the class and its fees, and make sure that a suitable room is available. The \$15 fee may seem large, but all resident students pay the same, and it covers more than three hundred hours of work. Compared with the cost of one term's music lessons, the cost is really very small. At the present time rural organizations are more interested in war relief than in new educational projects, but the College believes this branch work will develop well by and bye.

Since Macdonald Institute opened in 1903, Home Economics students have registered as follows:—

Professional:

Normal course lasting two years	209
Normal course, lasting one year	89
Housekeeper course, lasting two years	124

Non-professional:

Associate course, lasting two years	64
Homemaker course, lasting one year	434
Short course, lasting three months	1157
Part-time courses, lasting three to nine months..... (or optional courses).	196
Summer courses, lasting four or five weeks.....	81

Totaling..... 2,354

THE MANITOBA AGRICULTURAL COLLEGE

BY J. B. REYNOLDS, M.A., PRESIDENT

AT the Manitoba Agricultural College is offered a Home-makers' course extending

over two winter terms of five months each. In the first year the subjects studied in Home Economics are:—

Chemistry.
English.
Household art:
Clothing.
Drawing and design.
Home planning.
Laundry.
Millinery.
Textiles.

Household science:
Cooking.
Food and nutrition.
Home nursing.
Household management.
House construction.
Mathematics.
Poultry.
Physical culture.

In the second year, home furnishing, physiology and hygiene and bacteriology replace respectively home planning, household management, and mathematics. Dairying and horticulture may be studied also.

Those who can attend the college for one winter term only are con-

sidered in planning the first year work so that it will be of most use in the home.

A three-months' course in April, May and June is offered for those who cannot leave home for a longer period. The subjects of this course are:—

Foods.
Cooking.
Household management.
Home nursing.

Clothing.
Home furnishing.
Garment making.

In response to a request from students who have completed the Homemaker course to be permitted to continue their studies in Home Economics, the Board of Directors, at their meeting on May 21st, 1915,

decided to extend this course so that a student might proceed to a degree in Home Economics by completing a course of five winters of five and one-half months each or the equivalent.

The Third Year includes:

Household art:
Advanced dressmaking.
History of costume.
Home furnishing.

Biology.
Chemistry.

Household science:
Book reviews.
Foods.
History of home life.
Household management.
English.
History.

The Fourth Year includes:

Household art:
Costume design.
History of art.
Theory and practice teaching.
Household science:
Demonstrations.
Dietetics.
Economics of the household.
Invalid cookery.

Bacteriology.
Biology.
Chemistry.
Civics and history.
English and history.
Physics.
Physical culture.
Poultry.

The Fifth Year in Household Science will include dietetics and special diets, economics of the house-

hold, seminar periods, a thesis being required, also observation of and practice in teaching of children,

discussions of equipments and the planning of courses.

An Institutional Administration course is planned for those who have ability as administrators and because of the demand for trained directors for the management of various kinds of institutions. This course is designed to prepare mature students, who have the health and executive ability, for directing institutions such as college and school dormitories, or managing lunch rooms, cafeterias for philanthropic or commercial purposes, or for acting as dietitians in hospitals. The requirements for entrance to this course are as follows:—The student is required to make 50 per cent on each subject and 75 per cent of the total marks in each year of the Homemaker course. She must decide at the beginning of the Second Year that she elects the Institutional Management course. She must be 25 years of age at the beginning of the third year. During the second year she will get experience in the dormitory, kitchen and sewing room and as waitress. The subjects studied are:

- Principles of household administration.
- Institutional housework and management.
- Marketing and accounting.
- Experimental cooking.
- Invalid cookery.
- Daily work.
- Visits.

Negotiations are under way with the Department of Education to provide that graduates of the five-years' course will be permitted to teach Home Economics in our schools and colleges.

Students attending the Normal

school in Winnipeg spend one month only at the Manitoba Agricultural College. The time allotted to Household Science is 27 hours; 15 hours are given to foods, 3 of these are lectures periods, and 12 are laboratory periods. In this time it is attempted to arouse the interest of the student in school lunch work and to show them that with very little or no equipment much may be done in rural schools to make the child interested in his environment, hence to be observant. Six hours are given to housecraft, which includes an elementary study of the care of things (wood, metal, glass, etc.), found in the schoolroom and at home; also of the easiest methods of work, with an explanation of models of many labour-saving devices.

Six hours are allowed in which each student gives a seven-minutes demonstration before her own class. Simple topics are given out, and the demonstrator chooses the grade for which she wishes to teach this lesson and calls upon a certain number from the class to be her pupils.

No formal examination is given, but in each food lesson a test is made of the student's ability to make application of principles illustrated and lesson plans for different grades on different topics relating to the home. Plans for conducting school lunch work, and suggestions for correlation of this work with other subjects are required to be handed in.

Household Science in rural ungraded schools is thus looked upon as a method of teaching (relating studies to everyday life) rather than as a special subject.

SASKATCHEWAN

BY MISS F. A. TWISS, DIRECTOR OF HOUSEHOLD SCIENCE

AT the present time in Saskatchewan there is no advanced teaching in household science given to homemakers, household administrators for institutions

or teachers of household science: however, this year in the University of Saskatchewan a course is beginning which is expected to develop into a four years' course leading to a degree.

Household Science is one of the subjects on the course of study for the public school and is an optional subject on the curriculum of studies for high schools for both third and second class teachers. As a result of this students may be given sufficient instruction to enable them to teach household science as efficiently as any other subject.

To aid those already engaged in teaching summer sessions are held at the university. The courses are designed especially to help those engaged in teaching rural or village schools. They consist of lectures and laboratory work on food and its preparation, household management and sewing.

In the work of the first year the following is taken,—the classification of foods from standpoint of composition and use to the body, with special study of carbohydrates. The practical work is with fruits, vegetables and cereals, and for preparation and cooking such recipes are chosen as are applicable to the noon lunch in the rural school. Methods of conducting the noon lunch and ways of interesting parents and school boards are fully discussed, as are also the amount and cost of equipment required and the provision of food materials. Demonstration and practice in preparing the lunch serve to clarify ideas. The physiology of digestion is carefully studied.

In Household Management school and home are considered from the standpoint of site, planning, heating, lighting, ventilating, furnishing and influence of environment. Home care of the sick, simple bandaging and emergencies are taken under the direction of the St. John Ambulance Association, which issues certificates of First Aid to the Injured to each successful candidate.

In Sewing, the discussion of terms, tools, materials and supplies coincides with the study of cloth and the stitch

forms, with application on useful articles. Care and repair of clothing are considered, while constructive work takes the form of simple articles useful in school and a simply made garment by each student.

In the second year the work of the first year is continued and extended to include a more detailed study of the classification and function of foods with their physiological and economic value. The practical work is mainly with protein foods, such as milk, cheese, eggs and meat, and with combination of food materials.

The practice and demonstrations centre around balanced meals, the class serving these as often as time permits.

The physiology of digestion is extended to the consideration of the absorption and end products in the digestion of proteins, fats and carbohydrates.

Household Management includes a survey of rural school conditions, public hygiene and hygiene of the school child; care of water supply; disposal of waste; control of household and school pests. Home nursing, as prescribed by the St. John Ambulance Association, is taken under conditions similar to the first year.

The Sewing includes the study, care and use of attachments of the sewing machine, the study of textiles and the use of commercial patterns. The constructive work comprises the making of children's wear, undergarments, blouses and dresses. Courses for both graded and ungraded schools are discussed and drafted and discussions on school credit for work done at home, school fairs and boys' and girls' clubs are carried on.

In all subjects the application to school conditions found in the province is kept prominently in view.

On the successful completion of two summer sessions each candidate is granted a diploma.

UNIVERSITY OF SASKATCHEWAN

BY WALTER MURRAY, PRESIDENT, UNIVERSITY OF SASKATCHEWAN

UP to the present, we have not done all that we wish to do in Domestic Science. For four summers there have been at the university summer schools in agriculture and domestic science. We have also been holding every winter short courses in domestic science for homemakers' clubs in various parts of the province, and are planning this year for eight or nine such courses. They have been well attended in the past.

This year we have appointed an instructor in domestic science, Mrs. Rutter of Macdonald College, to take up her duties in January. Meanwhile temporary provision has been made for carrying on a course at the university for teachers. The university course is intended for

students who are taking their Normal training at the Normal school in Saskatoon. We hope that we may be able in the near future to establish a properly equipped school of household science to minister to the needs of the following classes:

Farmers' daughters who wish to come in for a course of one or two years during the winter months.

Household administrators.

Teachers in public schools.

Teachers of household science.

We propose as soon as possible to offer household science as an elective for the B.A. and B.Sc. courses, but until the war conditions are passed, it is not advisable to launch out on any scheme involving much expenditure of money.

ALBERTA

DEPARTMENT OF EDUCATION

BY JAMES C. MILLER, PROVINCIAL DIRECTOR OF TECHNICAL EDUCATION, EDMONTON

IN each of the three provincial Schools of Agriculture home makers' courses for girls from rural communities are offered and each year an increasing number of girls are taking advantage of them. These courses are planned to meet the needs of the rural communities.

In the high schools in Edmonton and Calgary the subject is taught as part of the regular curriculum for the first two years, i.e., in grades IX and X.

In the Provincial Institute of Technology and Art there will be a School of Household Arts to be opened in the autumn of 1917 in which advanced courses will be offered (a) for those who wish to qualify as teachers of household arts, (b) for household administrators, (c) nursing, (d) home-makers. The last mentioned courses will be planned to meet the needs of urban communities.

DEPARTMENT OF AGRICULTURE

BY JAMES MCCAIG, EDITOR OF PUBLICATIONS, DEPARTMENT OF AGRICULTURE, EDMONTON

IN the first place, in respect to home-makers, the school boards in the chief cities of the province have had in operation for a number of years school service in household science designed to

give girls in both the public and high schools instruction in cooking and sewing, so as to enable them to take up the home duties with greater interest. These courses appear to be well organized, to be in the hands

of a superior class of teachers, and seem to be very popular with both the parents and the children.

The Normal schools give courses to teachers with a view principally to the securing of an organization of material for simple courses for pupils in the elementary schools of the country. The Normal schools do not yet prepare special teachers in domestic science.

The Department of Education carries on summer school courses for such subjects as domestic science, manual training, art, agriculture and school gardening, etc. These courses last about five weeks. No teacher is allowed to take more than two courses, which secures concentration on the work chosen. From the work done in the public and high schools, the Normal schools and special summer classes, it is expected that teachers will ultimately develop a type of efficiency in teaching household science such as they now have in the ordinary school arts.

Probably the most important educational service in the interest of home-makers is that afforded by the provincial agricultural schools which are administered by the Department of Agriculture. These schools provide a five months' course extending over two years for both boys and girls. The subjects taught to the girls include cooking, sewing, laundry work, household administration, sanitation, home-nursing, together with the science underlying these, besides English and household accounting. The courses in dairying, poultry keeping and horticulture are likewise open to girls and instruction is free. The schools have been in operation three years. The attendance has been as follows:—

The term 1913-14.	62
" 1914-15.	70
" 1915-16.	109

While these numbers may not

appear large in the total number of people needing such assistance, these schools at present are the only ones in which specialized instruction in household science is given in the province. The rapid increase in attendance for the three years and the possible doubling of the number of schools in the near future will greatly increase the importance of this work.

With regard to household administrators for institutions, it cannot be said that we have yet any organized educational service for the fitting of this class of workers. There is no doubt but that the provincial university would have had advanced courses in domestic science provided for if it had not been for the checking of suitable expansion on account of the war. It is the case, however, that some of the graduates of the agricultural schools are doing a good kind of systematic work in their own districts. Some of them are conducting courses in cooking and home-nursing.

With regard to teachers of household science there is not much to report. The courses at the summer schools have relation principally to country teachers, and not especially to domestic science teaching. The Provincial Institute of Technology in Calgary will institute professional courses for teachers next year, but at present we cannot be said to have any machinery for the turning out of duly qualified teachers in domestic science.

Previous to the establishment of the Provincial Institute of Technology it was thought that the provincial schools of agriculture might provide the teaching necessary for fitting specialists in this work. It is probable, however, that this work will serve as the beginning of a more advanced course, or, in the case of regular qualified teachers, will fit them to do a certain amount of useful work in country schools.

NEW BRUNSWICK

FOURTH ANNUAL CONVENTION OF THE WOMEN'S INSTITUTES

BY GORDON ROGERS, DEPARTMENT OF AGRICULTURE, CANADA

THE fourth annual convention of the Women's Institutes of New Brunswick was held at St. John on November 1st to 3rd, 1916. Delegates from every part of the province assembled at the Germain Street Institute in the city of St. John, firmly convinced of the much greater part they were playing in the betterment of home and national life in New Brunswick through the work of the women's institutes.

The report of Miss Hazel Winter, Supervisor, showed an attendance of more than 12,000 at various meetings; amount collected, \$16,285.98; amount expended for soldiers in hospitals, \$4,189.47, with \$300 still on hand for patriotic purposes; 7 new branches opened, and 200 new members added to the list.

Miss Winter defined the women's institute movement as having to do with homes—the feeding of little children, avoidance of waste, proper furnishing and the arrangement of household work on a systematic and economical basis—all of which, she said, quite properly, tends to develop a higher standard of community life. But her report showed that the women of the institutes have gone beyond their own homes to the larger conception of their village or neighbourhood as a home, and taken effective measures to secure improvement for the common good. She urged a co-operative spirit with the farmers' institute, by which could be developed a rural social advancement, which would rival urban improvement, social leagues, boards of health, etc.

The Provincial Secretary for Agriculture, Mr. J. B. Daggett, gave an address, and heartily commended

Miss Winter's work during the past year.

The programme included the following addresses and demonstrations:—

"Women's Institutes in Prince Edward Island," Miss Hazel L. Stearns, Supervisor.

"Possibilities of Women's Institutes," Mrs. N. W. Eveleigh, Sussex.

"How Women in Rural Districts may become Self-supporting," Miss Lenna A. MacLean, Centre Nappan.

"Physical Culture as a Character Builder," Mr. A. S. McFarlane, Provincial Normal School, Fredericton.

"The Use and Abuse of Movies," Prof. W. C. Kierstead, University of New Brunswick, Fredericton.

"Women's Institutes in Nova Scotia," Miss Jennie A. Fraser, Supervisor.

"The Needs of Our Soldiers," Mrs. John McAvity, President Local Branch Red Cross Society, St. John.

"Dental Education as Applied to Women's Institutes," Dr. R. B. Hagerman, East Florenceville.

"Home and School Sanitation," Mr. Gordon Rogers, of the Public Health Branch, Department of Agriculture, Ottawa,

"Demonstration: Table Setting and Serving," Miss Ada B. Saunders, Assistant Supervisor, New Brunswick Institutes.

"Classes in First Aid and Home Nursing," Miss Lillian Hazen, St. John.

"A Model Institute Meeting," Mrs. James Porter, Andover.

"Illustrated Travel Talk," Miss Hazel Winter.

This was an account of the 12,000-mile trip to Alaska and back, won by Miss Winter in *The St. John Standard* competition last summer. Miss Winter described her trip, illustrating it with coloured slides.

A very interesting feature of the convention was an exhibit in handicraft and sewing, the work done by the pupils of the women's institute 1916 short courses.

BRITISH COLUMBIA

AGRICULTURE IN HIGH SCHOOLS

BY J. W. GIBSON, M.A., DIRECTOR OF ELEMENTARY AGRICULTURAL EDUCATION,
IN THE JOURNAL OF AGRICULTURE, VICTORIA, B.C.

THE rural-science work of the public schools, which includes the entire programme of nature-study and school-gardening, is the logical antecedent of a more scientific study of agriculture in high schools.

It is only recently that any provision has been made in connection with our high-school courses of study to meet the needs of those who aim at making agriculture a life study or a life-work. At the present time the students in attendance at five of our high schools have been given this opportunity of taking up the scientific study of agriculture. It is expected, however, that in the near future other schools and other districts will have these agricultural courses established, and that before many years have passed provision will be made for the study of agriculture in all districts in British Columbia where the practice of agriculture is, or may be, of great importance.

CLASSES AND INSTRUCTORS

In September, 1915, the first agricultural class in the province was organized in the high school at Chilliwack, with Mr. J. C. Readey, B.S.A., as instructor. In September, 1916, classes were organized at Cloverdale, in the municipality of Surrey, and Murrayville, in the municipality of Langley, with Mr. E. L. Small, B.S.A., as instructor; and also at Armstrong and Vernon, in the Okanagan valley, with Mr. J. E. Britton, B.S.A., as instructor. In all, 130 boys and girls are at present taking up the study of agriculture under these agricultural specialists. In the Chilliwack high school both first and second-year classes in agriculture are in progress.

A course of study intended to cover at least two years in the high school

has been prepared and is now being followed out in these five schools. It includes the study of soils, fertilizers, and drainage; fodder, grain, and root crops; vegetable and flower gardening; fruit-growing; animal husbandry and poultry-raising; dairying and bee-keeping; farm accounting and marketing; farm mechanics (for boys only); and special practice in the purchase and preparation of foods (for girls only).

The course as planned is presented in the most practical and scientific manner possible, emphasis being placed on first-hand studies by the students themselves in the laboratory and experimental garden. This "concrete" and practical method of study is still further practised by having the students take occasional class periods to visit convenient farms, orchards, or poultry-ranches, where under the immediate direction of their instructors they observe and record in their note-books important points brought out in this outdoor lesson.

EQUIPMENT OF CLASS-ROOMS

Each agricultural class-room is equipped with the necessary apparatus and materials for the proper handling of the course, such equipment costing about \$400 for each school. Besides providing a suitable class-room with laboratory, study tables, and the necessary equipment, each School Board provides and prepares the ground for experimental and demonstration plots. From one-half to one acre is required for these agricultural and garden plots. All such expenditures, together with the travelling expenses of the district supervisor or instructor, amounting in all to about \$800 per year, are paid by the school boards concerned. The salary of the instructor is paid by the Education Department.

PART IV

Special Contributions, Reports of Agricultural Organizations, Notes and Publications

CANADA'S WHEAT PROBLEM

CONDENSED FROM AN ADDRESS DELIVERED BY MR. W. SANFORD EVANS, CHAIRMAN OF THE GEORGIAN BAY CANAL COMMISSION

MR. W. Sanford Evans, Chairman of the Georgian Bay Canal Commission, delivered an address on Tuesday evening, November 14th, before the Board of Trade of Ottawa on Canada's Wheat Problem. In his introductory remarks, Mr. Evans indicated the line of study upon which he had been engaged for some months with the object of determining the economic feasibility of the proposed Georgian Bay Canal. Then, referring to the wheat problem a diagram was shown indicating the relative size and importance of the world's production of wheat, international trade in wheat, and the production of wheat in Canada, by which it was seen that the latter items were about 15 per cent and 5 per cent respectively of the total world's production of wheat.

Since the production of wheat in Canada would naturally be controlled to a large extent by European markets, it was necessary to determine how much, how and where, Europe now buys its imported wheat and flour, and also the price tendencies of European markets. A diagram was shown illustrating the first two points, by which it was seen that Europe buys its wheat week by week in comparatively uniform quantities. As Great Britain is the largest individual importing wheat market in the world it was divided from continental Europe in a separate figure, by which it was seen that the United Kingdom imported wheat in even more uniform quantities than the continental European countries. Dealing with actual figures, Mr. Evans explained that for the decade previous to the war the importing world took on an average 562,000,000 bushels of wheat per year, of which Europe took 484,000,000 bushels, or 86 per cent; of this latter, again, Great Britain imported 217,000,000 bushels, or 45 per cent. The net importing countries of Europe as a whole import one bushel of wheat to every

three bushels that they consume, Great Britain, of four bushels she consumes, imports three.

SHIPMENTS FROM THE CHIEF EXPORTING COUNTRIES

The next diagram shown illustrated the weekly shipments of wheat and flour from the chief exporting countries, namely, Australasia, Argentine, India, Balkan States, Russia, United States and Canada, also averaged for the same period as the preceding diagram. By this means the somewhat heavier shipments in the months immediately following the harvest in each country were shown, also the varying quantities retained for shipment during the remaining parts of the year by the different countries. An interesting feature was the difference in the effect of the opening of navigation on the shipments from North America and those from Russia, the latter being very much more evenly distributed than the former.

The speaker next referred to some diagrams which he had just recently had prepared to illustrate the fundamental relationship between the size of each year's crop and prices. One of these diagrams illustrated the world's wheat production from 1903 to 1914, together with the prices of contract grade wheat at Liverpool, which was taken as the representative wheat market of the world. The notable feature was that a decrease in price almost invariably corresponded with an increase in the size of the crop and *vice versa*, the only exception being that in the case of two small crops occurring in consecutive years the price would tend to be higher in the second year, and in the case of two consecutive large crops the price would decline to a minimum in the second year. Reference was also made to the relationship between the supply, consumption, prices and the general tendency of repre-

sentative wholesale prices of all commodities.

METHODS OF MARKETING

Other diagrams shown by Mr. Evans were used to illustrate the methods of marketing wheat in Canada and the effects thereof. Taking Fort William—Port Arthur as the marketing point of Western Canadian wheat, it was shown that wheat was delivered at this point in extremely heavy quantities in October, November and December, and to a somewhat less extent in May. During the close of navigation wheat was stored in the elevators reaching a maximum in April of each year with the consequence that in May and October or November of each year very large quantities of wheat were put on the market. The relationship between these quantities and the quantities actually imported by Great Britain was then indicated, showing that at times the Canadian marketings at the terminal elevators were far in excess of the total purchases of the United Kingdom of all kinds of wheat and flour from the whole world. The corresponding prices at Liverpool and Winnipeg were shown to have declined in a marked way at each period when Canada's offerings reached excessive

proportions, and at the same time shipments from Fort William—Port Arthur reached their maximum when the price was lowest; in fact over 60 per cent of Canada's wheat has in some years been shipped at lowest prices.

Dealing with the effects of this method of marketing on the country's transportation systems, the speaker illustrated the extreme peak loads carried by the railways and lake shipping and also the great irregularity in the employment of labour handling the grain traffic. In the case of lake shipping the effect was that rates in October, November and December, the large grain shipping months, were more than twice the normal. Mr. Evans then pointed out that Canada pays high rates on grain transportation on the lakes, employs labour in an uneconomical way, pays fixed charges on excessive railway equipment and sells the bulk of its wheat at the lowest price. "Is this good business?" he asked.

The speaker dealt very briefly with the effect of high ocean freight rates on the marketing of the large crop of last year, particularly by increasing the relative value and, therefore, the price, of wheat from North America as compared with that from other exporting countries.

LOANS FOR BUYING CATTLE

SEEING the necessity of developing agriculture to take the place of a declining lumber industry, business men of Ashland, Wisconsin, conceived of a plan which, because of its merit, has been adopted in many other sections. The Ashland Commercial club made a survey of the country tributary to Ashland, which showed the number of farmers who would buy cows if credit could be arranged. Each farmer was asked to sign an application showing the number of cows he then had, the number he wanted to buy, the breed preferred, whether pure-bred or grade animals were desired, and the number of acres cleared. He agreed to raise all heifer calves, to accept the cows purchased, and to pay actual cost at Ashland, paying within three years for the cows bought from his monthly cream check and at the rate of not less than \$3.00 a month a cow. Payment was secured by chattel mortgage on the cows and their progeny, and if necessary, other personal property. Two banks agreed to furnish the money to buy cattle, with interest at six per cent if the

business men would guarantee them against loss; in other words, if the business men would lend their credit to the farmers. This was done. The bankers then appointed a committee to pass upon the applications. A competent committee was selected to buy the cows. In 1913, five carloads of grade cows, representing an investment of \$9,475, were purchased. By January 1st, 1914, \$2,613.74 was repaid. No guarantor was called upon to make good. Worthy farmers got their cows on three year notes, interest at six per cent, secured by chattel mortgages and not by mortgages on their farms. There was a better understanding between farmer and business man, better conditions in the country, improved homes, more silos, better barns, intelligent feeding, and a general educational campaign. Live stock raising has become the leading industry in this community. Creameries and cheese factories have been built. Community breeding has been made effective and testing associations are flourishing. . . .
Raymond Baker, in The Banker-Farmer.

STUDENT ENROLMENT, 1916-17.

THE following table shows the number of students enrolled in the Canadian Schools and Colleges of Agriculture, and in the Veterinary Colleges for the college year, 1916-17:

AGRICULTURAL COLLEGE, TRURO, N.S.	
First Year Students	33
Second " "	15

Total..... 48

It is anticipated that this number will be increased by about 10.

OKA AGRICULTURAL INSTITUTE,
LA TRAPPE, QUEBEC

1st Year	34
2nd Year	32
3rd Year	21
4th Year	20
Special Courses	22

Total..... 129

SCHOOL OF AGRICULTURE,
STE. ANNE DE LA POCATIÈRE, QUE.

Agricultural Course: 1st Year (A)	15
1st " (B)	31
2nd "	15
3rd "	9

Practical Course: 1st Year	21
2nd "	23

Total..... 114

MACDONALD COLLEGE

School of Agriculture	
First Year	19
Second Year	18
Third Year	12
Fourth Year	13
	62

School for Teachers

Model School Class studying for Model School Diploma	107
Elementary Class studying for the Elementary Diploma	39
Kindergarten Class studying for Kindergarten Diploma	10
Summer School in Nature Study and Elementary Agriculture	32
	188

School of Household Science

Institution Administration, Senior	14
Institution Administration, Junior	5
Homemakers	39
Autumn Short Course (one or four)	5
	63

Total attendance..... 313

THE ONTARIO AGRICULTURAL COLLEGE
Agricultural Courses:

First Year	69
Second Year	52
Third Year	36
Fourth Year	30
Specials	2
Manual Training	5

Total in Agriculture..... 194

Macdonald Institute:

Jr. Normal Domestic Science	15
Sr. " "	10
Jr. Associate	11
Sr. " "	8
Jr. Housekeeper	12
Sr. " "	8
Homemaker Courses	30
Short Course	12
Optional Course	1
Student Workers	2

Total at Macdonald Institute... 109

Total attendance..... 303

MANITOBA

Boys: 1st Year	38
2nd "	19
3rd " Diploma	5
3rd " Degree	14
4th "	9
5th "	8
Teachers' Course	3
	96

Girls: 1st Year	37
2nd "	30
3rd "	7
4th "	6
	80

Total attendance..... 176

It is likely that two more students in the Fourth Year class (men) will register later.

UNIVERSITY OF SASKATCHEWAN,
SASKATOON, SASK.

Associate Course:

First Year	36
Second Year	20
Third Year	5
	61

B.S.A. Course:

First Year	8
Second Year	5
Third Year	5
Fourth Year	6
	24

Total..... 85

ALBERTA

SCHOOL OF AGRICULTURE OLDS

First Year, Boys	32
Second " "	13
	<hr/> 45
First Year, Girls	33
Second " "	8
	<hr/> 41
Total	86

SCHOOL OF AGRICULTURE, CLARESHOLM

First Year, Boys	40
Second " "	20
	<hr/> 60
First Year, Girls	25
Second " "	9
	<hr/> 34
Total	94

SCHOOL OF AGRICULTURE, VERMILION

First Year, Agriculture	17
Second Year, "	13
First Year Domestic Science	15
Second Year Domestic Science	4
Total	<hr/> 49

It is anticipated that six boys and three girls will enter the courses later in the year.

FACULTY OF AGRICULTURE, UNIVERSITY OF ALBERTA

First Year	10
Second "	12
	<hr/>
Total	22

COLLEGE OF AGRICULTURE,
BRITISH COLUMBIA

In a letter to THE AGRICULTURAL GAZETTE regarding student enrolment, L. S. Klinck, Dean, Faculty of Agriculture, writes as follows:

As we are not in a position to offer work in Agriculture leading to a degree this year, we do not have any regular Agricultural students enrolled. Last year thirty-six students in Arts elected the course on the "Scientific Basis of Agriculture", which was given during the fall term. This year owing to unavoidable conflict in courses, a number of options have suffered severely and, in the case of Agriculture, we have but three students taking this work.

SCHOOL OF COMPARATIVE MEDICINE AND
VETERINARY SCIENCE, MONTREAL

Students in attendance:

First Year	21
Second "	22
Third "	18
	<hr/>

Total 61

ONTARIO VETERINARY COLLEGE, TORONTO

First Year	41
Second "	48
Third "	43
	<hr/>
Total	132

SUMMARY OF ATTENDANCE

Agricultural College, Truro, N.S.	48
Oka Agricultural Institute, La Trappe, Que	129
School of Agricultural, Ste Anne de la Pocatière	114
Macdonald College	313
Ontario Agricultural College	303
Manitoba Agricultural College	176
College of Agriculture, Saskatoon, Sask	85
Schools of Agriculture, Alberta	229
Faculty of Agriculture, University of Alberta	22
College of Agriculture, British Columbia	3
School of Comparative Medicine and Veterinary Science, Montreal	61
Ontario Veterinary College	132
	<hr/>
Total	1,615

ASSOCIATIONS AND SOCIETIES

The annual convention of the Manitoba Dairymen's Association will be held at the Manitoba Agricultural College, Winnipeg, on February 15th and 16th, 1917. Secretary, L. A. Gibson, 301 Beverly St., Winnipeg, Manitoba.

The annual convention of the British Columbia Dairymen's Association will be held in the city of Nanaimo, on January 25th and 26th, 1917. Arrangements are being made to hold competitions for producers in market milk, approved milk, cream, and creamery butter classes.

Over \$500 in cash prizes will be distributed. The acting secretary of the association is Mr. T. A. F. Wiancko, Department of Agriculture, Victoria.

The Manitoba Winter Fair will be held at Brandon from March 5th to 9th, being the week preceding the Saskatchewan Winter Fair at Regina. A judging contest between the three Western agricultural colleges for a silver cup will be one of the features at the fair at Brandon. Secretary, W. I. Smale, Brandon, Manitoba.

THE PERCHERON HORSE BREEDERS' ASSOCIATION

The Percheron Horse Breeders' Association has issued a 28-page booklet containing besides the minutes of the ninth annual meeting held at Calgary, Alta., on July 3rd, 1916, an appeal to breeders to join the association and to breed the best. The advantage of the large horse over the smaller is pointed out. Papers are also

included advocating the claims of the Percheron to greater recognition by J. L. Edmonds, Assistant Professor of Horse Husbandry at the Illinois College of Agriculture, by E. T. Robbins, County Agent, Illinois, and by H. E. MacCartney, Secretary, Indiana Stallion Enrolment Board.

ANNUAL CONVENTION OF QUEBEC VETERINARIANS

The annual convention of the Veterinary Society of the province of Quebec was held at Montreal October 24th, 25th and 26th, 1916. Among the speakers was Dr. C. H. Higgins, Pathologist of the Health of Animals Branch, Ottawa, who spoke on the use of the various bacterines and serums and the part they play in the control of contagious diseases of animals. Dr. N. E. McEwen devoted his attention to "The Benefits derived from Stallion Inspection in the Province." On the second day of the convention a visit was paid to Macdonald College, where, in the absence of the principal, the visitors were received by Professor Lochhead, who, in the course of a short address, emphasized the importance of the veterinary profession. Mr. A. R. Ness dilated on the policy pursued at the

college in the breeding of horses. The third day was devoted to a demonstration in clinics, Dr. Fowler, of Toronto, formerly lecturer in veterinary surgery at the Ontario Veterinary College, conducting the operations. A banquet followed the election of officers, which resulted as follows: President, Dr. A. Dauth; first vice-president, Dr. A. J. Hood; second vice-president, Dr. L. P. H. Lorrain; third vice-president, Dr. C. A. Decary; fourth vice-president, Dr. N. E. McEwen; fifth vice-president, Dr. J. J. Irwin; sixth vice-president, Dr. J. A. Beaudry; secretary-treasurer, Dr. J. H. Villeneuve; associate secretary, Dr. G. Dujardin. After the election, Dr. C. A. Decary, of Montreal, gave an address on "Professional Etiquette."

THE ONTARIO PROVINCIAL PLOUGHING MATCH

THE Ontario Provincial Ploughing Match was held on "Meadowbrook" farm near Whithy in Ontario County, on November 1st, 2nd, and 3rd. It was conducted under the auspices of the Ontario Ploughmen's Association, of which Mr. J. Lockie Wilson, Department of Agriculture, Toronto, is the secretary. The event consisted of a ploughing match with

walking ploughs and a light tractor and farm machinery demonstration.

The ploughing match which included classes for men with high cut and jointer ploughs respectively in sod, and for men and boys in stubble, was held on the second day. The competition was open to the whole province and not confined, as in previous years, to prize winners at local matches.

The tractor demonstration was in operation during the three days. There was also on exhibition a large quantity of farm machinery capable of being operated by tractor power, including threshing machines, grinders, potato planters, binders, manure spreaders, and other implements. Five makes of tractors, hauling ploughs and other machinery, were in operation. These used as fuel both gasoline and kerosene, and drew, when ploughing, from two to five ploughs. While the tractors

did not compete for prizes they endeavoured to accomplish the maximum of work in the best fashion. One machine hauling a two-furrow plough turned an acre of land in fifty-five minutes on three gallons of kerosene. The ploughing was from six to seven inches deep.

The keen interest taken by the farmers of the surrounding country was manifested by an attendance which was estimated to comprise from ten thousand to twelve thousand people.

THE ENTOMOLOGICAL SOCIETY OF ONTARIO

THE Entomological Society of Ontario held its 43rd annual meeting at the Ontario Agricultural College, Guelph, Ontario, on November 2nd and 3rd. Addresses were delivered on subjects pertaining to the work and objects of the society, by Rev. Dr. Fyles, Ottawa; Professor L. Caesar, Provincial Entomologist for Ontario; Professor Glen W. Herrick, Cornell University; Professor W. H. Brittain, Provincial Entomologist for Nova Scotia; Dr. L. O. Howard, Chief of the Bureau of Entomology, Washington, D.C.; Professor R. Matheson, Cornell University; Professor W. Lochhead, Macdonald College, Quebec; Dr. C. Gordon Hewitt,

Dominion Entomologist and others.

The officers elected for the ensuing year were as follows.

President, A. F. Winn, Westmount, Que.; vice-president, Prof. L. Caesar, O.A.C.; secretary-treasurer, A. W. Baker, O.A.C., Guelph; curator, W. Evans, Guelph; librarian, Rev. Prof. C. J. S. Bethune, O.A.C.; directors, Arthur Gibson, Ottawa, Ont.; C. E. Grant, Orillia; Dr. A. Cosens, Toronto; F. J. A. Morris, Peterboro; J. W. Noble, Essex; W. A. Ross, Vineland; editor, Canadian Entomologist; Prof. E. M. Walker, M.D., University of Toronto; delegate to Royal Society of Canada, F. J. A. Morris, Peterboro.

THE ONTARIO HORTICULTURAL ASSOCIATION

THE eleventh annual convention of the Ontario Horticultural Association was held at Toronto on November 22nd and 23rd. There were present directors representing most of the nine districts as well as a large number of delegates from individual societies. The president, Rev. G. W. Tebbs, of Hamilton, conducted the meetings.

The report of the secretary, Mr. J. Lockie Wilson, Department of Agriculture, Toronto, showed that there were ninety-one societies having sixteen thousand members in affiliation with the parent organization. The reports from affiliated societies showed that work of varied and extensive character was being carried out over the province. This included the planting of trees, the beautifying of school and other public grounds, the encouragement of the school garden, the planting of vacant lots, importation and distribution of bulbs and other plants, the carrying on of garden competitions, the conservation of bird life and many other activities.

Resolutions were adopted calling upon the provincial Department of Agriculture to identify more intimately the conservation of bird life with the science of horticulture, and also to render available to all horticultural societies throughout the

province, the services of a landscape architect. The following officers were elected:—

President: Dr. F. B. Bennett, St. Thomas; 1st vice-president: Prof. J. W. Crow, O.A.C., Guelph; 2nd vice-president: Wm. Hartry, Seaford; secretary and editor: J. Lockie Wilson, Toronto; treasurer: C. A. Hesson, St. Catharines; honorary director: Rev. G. W. Tebbs, Hamilton.

DIRECTORS: District No. 1, Rev. A. H. Scott, Perth; District No. 2, Walter T. Ross, Picton; District No. 3, R. Whorley, Haileybury; District No. 4, T. D. Dockray, Toronto; District No. 5, Jas. Ogilvie, Hamilton; District No. 6, J. Grieves, Seaford; District No. 7, R. E. Kilmer, Brantford; District No. 8, Dr. J. A. Bothwell, Stratford; District No. 9, C. D. Brown, Walkerville.

Auditors: Mrs. R. B. Potts, Hamilton, and Miss Mary Yates, Port Credit.

Representatives to America Civic Association: J. N. Bennet, Barrie; Rev. G. W. Tebbs, Hamilton, and J. Lockie Wilson, Toronto.

Representative to Civic Improvement League: R. B. Whyte, Ottawa.

Representative to School Gardens Association of America: C. B. Hamilton, Toronto.

THE ONTARIO WOMEN'S INSTITUTES

THE annual conventions of the Women's Institutes of Ontario were held at Ottawa on October 31st and November 1st, at London, November 8th and 9th, and at Toronto on November 21st and 22nd.

There were present at the Ottawa convention 150 members representing 83 institutes, at the London meeting 450 members, representing 175 institutes, and at Toronto 700 members, representing 642 institutes, all of which represent a total membership of thirty thousand.

While the usual institute work has not been neglected the spirit of sacrifice has dominated the activities of the organization. It is estimated that upwards of \$400,000.00 in money and goods have been contributed for relief and patriotic work by the women's institutes of the province since the outbreak of the war.

A feature of the work during the past

year has been the organization of a number of junior branches termed Girl's Institutes. These organizations are meeting and working along patriotic lines in providing goods and money for relief work. Home gardening and canning contests have also been introduced. Awards were given for the best vegetable gardens grown by institute members according to a plan laid down by a central committee. Twenty-two branches, totalling 245 entries, were engaged in this work.

Interest has continued to be taken in the improvement of rural schools from the standpoints of sanitation and beauty. Medical inspection has been introduced into many of the schools through the influence of women's institutes. Much has been accomplished through demonstration lecture courses of two weeks each on foods and their preparation, home-nursing and sewing.

THE BRITISH COLUMBIA VETERINARY ASSOCIATION

AT the annual meeting of this association held in September, 1916, an alteration to the by-laws of the association to admit honorary and associate members was drafted and passed. Addresses were given by Dr. Swenerton on his experience in England and France as a Veterinarian in the British Army, and by Dr. Bruce on the poisonous plants of British

Columbia. The officers elected for the ensuing year were as follows:

President, Dr. S. F. Tolmie, V.S.; vice-president, Dr. Geo. Howell, V.S.; secretary-treasurer and registrar, Dr. K. Chester, V.S.; council, Dr. W. W. Alton, V.S., Dr. T. H. Jagger, V.S., B.V.Sc.; Dr. J. G. Jervis, V.S., B.V.Sc., Dr. W. H. Pickering, V.S.

Good progress is being made in the New Brunswick forest survey under the supervision of Mr. P. Z. Caverhill, Provincial Forester. Upwards of two hundred thousand acres had been covered up to the middle of October, some of the maps having practically been completed. The object of the survey is, for purposes of settlement, to ascertain the land on which farming can be satisfactorily conducted. The question of forest protection from the ravages of fire is also being considered. A soil type map of the entire forest area is to be made.

NEW PUBLICATIONS

THE DOMINION DEPARTMENT OF
AGRICULTURE

Report of the Minister of Agriculture for 1915-16. That the work of each branch of the Department has been efficiently carried on is borne testimony to by the Minister in this report, which is for the year ending March 31st, 1916. A synopsis of the operations of branches and divisions is given as well as the orders in council affecting agriculture passed during the year. An amendment to the regulations of the Animal Contagious Diseases Act prohibited the feeding of swine upon garbage or swill obtained elsewhere than on the premises where fed except by special permission of the Veterinary Director General. Other orders in council affected changes in the Destructive Insect and Pest Act and the Seed Control Act. Various meetings of importance at which the Department was officially represented are mentioned, and acknowledgment made of the gracious gift by His Majesty King George V of the thoroughbred horse Anmer. The Dairy and Cold Storage Branch is first dealt with and its wide range of activities reviewed. Next to command attention is the Seed Commissioner's Branch, reference to the activities of which start with the recalling of the fact that in co-operation with the Minister of Trade and Commerce special grades for wheat, oats and barley entering the Government interior terminal elevators had been provided. A dozen pages are devoted to the Live Stock Branch, opening with the gratifying statement that the export trade in live stock products with Great Britain had developed considerably and to some extent with France. During the year eggs to the value of \$2,800,000 were shipped overseas. Conditions warrant the expectation of increased production in practically all classes of our farm animals. Important suggestions in the general review of the operations of the Branch are that "The extensive resources of our Dominion, agriculturally, will probably never be fully realized except through the continuous and progressive extension of our live-stock industry," and that "It has never before been so clearly demonstrated that the financial stability of farming is dependent upon the breeding and feeding of live stock." Particulars are given of the progress made in the many new lines of policy that have recently been inaugurated, such as the loaning of pure-bred stock, federal assistance to stallion-hiring clubs, assistance in the purchase of breeding stock in carload lots, aid to exhibitions, improved methods of marketing, encouragement of co-operation, egg-trade improve-

ment, organization of an intelligence service, grading of wool and extension of British trade in frozen and canned goods. Next in order is a summary of the wide range of work at the Experimental Farms and stations and of the various divisions. The extensive and important work of the Health of Animals Branch is reviewed, showing how much has been done to suppress and check the spread of disease and to prevent unsound animals being slaughtered for food. The thoroughness of the work of the Fruit Branch is noted in the extension of marketing, in securing better facilities for transportation, in the betterment of picking, packing and preservation, in the matter of inspection and in other ways. The Entomological Branch, the Publications Branch, the Branch of the Canadian Commissioner of the International Institute of Agriculture all receive their meed of attention. Dr. Montizambert, Director General of Public Health, in thirty pages, deals with matters of public health and quarantine during the year. The Report concludes with some notes on Canada's part in the expositions at San Francisco and San Diego, by Wm. Hutchison, Canadian Exhibition Commissioner.

THE DOMINION EXPERIMENTAL
FARMS

THE DIVISION OF HORTICULTURE

The Apple in Canada; its Cultivation and Improvement, by W. T. Macoun, Dominion Horticulturist; Bulletin No. 86. Mr. Macoun in this bulletin has prepared a work unusually comprehensive in character and replete with information on a subject of the utmost importance to the apple industry of Canada. The author himself tells in his letter of submittal why and for what object he has written the bulletin, which comprises 136 pages. Its purpose, he says, is both to record the results of experimental work with the apple at the Central Experimental Farm and branch farms and stations, and to give information in regard to the best methods of propagating this fruit and of planting and caring for apple orchards. Lists of varieties of apples recommended for the different provinces of Canada will be found in the bulletin with descriptions of them and of other varieties. The list of those recommended are based on experiments with varieties at the Central and branch farms and stations and the experience of fruit-growers in different parts of Canada. Suggestions for exhibiting and judging apples are included in the work. Opening with interesting data regarding the age

and numerous varieties of the apple Mr. Macoun discourses of the fruit in each of the nine provinces. Among other important statements he says that in 1911 the enormous quantity of 1,734,000 barrels were packed and sold from the Annapolis and adjacent valleys. He next proceeds to speak of the extent of the orchards at the Central Experimental Farm and to treat of the many experiments that have been made. This portion of the bulletin is illuminating as to the magnitude with which this single line of the work at the Farm is carried on. Very full details are presented of the methods pursued and of the conclusions arrived at. Not a single branch of apple cultivation is overlooked. In short, being a complete text book, the bulletin should prove invaluable to apple-growers.

THE PROVINCIAL DEPARTMENTS OF AGRICULTURE

PRINCE EDWARD ISLAND

Department of Agriculture Annual Report. A noteworthy feature of the annual report for the year ending December 31st, 1915, of the Commissioner of Agriculture for the Island, is the testimony it bears to the good resulting from the "Patriotism and Production" campaign, the progress of agricultural education due largely to the funds forthcoming from the grant under THE AGRICULTURAL INSTRUCTION ACT, and to the improvement of live stock resulting from the activities of the Live Stock Department of the Dominion. All the reports of the chiefs of divisions are given with plentiful statistics and records of competitive results and special reports on the co-operative marketing of wool and on the operations of the Silver Black Fox Breeders' Association.

ONTARIO

Peach Growing in Ontario, by F. M. Clement, B.S.A., Director, and A. G. Harris, B.S.A. Pomologist. Very full and complete is the information about the cultivation of the peach contained in Bulletin No. 241 of the Fruit Branch of the provincial Horticultural Experiment Station prepared by Messrs. Clement and Harris. An illustration illuminates the text of many of the pages. Nine of the principal varieties are shown with exterior and interior exposed. Trees thinned and unthinned, twigs of different varieties bearing and non-bearing, peaches in baskets and boxes, types of baskets, a diagram of producing months in thirty-two states and the province of Ontario, pictures of insect pests in various stages of development and diseased fruit and limbs are all enlightening illustrations. One particularly valuable feature is a list of the

best varieties suitable for growth in Ontario with an outline of their qualities and time of ripening. Increased acreage led to increased production and, according to the authors, to lower prices to the growers. Prices for 1913 and 1915 were, they say, comparatively low, while 1914 was "a complete failure." Planting in 1915 and 1916, we are told, was comparatively light and consequently the prospects favour better financial returns. It is hardly necessary to say anything more than that the bulletin is a treatise on all the necessities of cultivation of the peach with considerable advice on packing and shipping. Mr. Edwin Smith, lately in charge of the Dominion Precooling Plant at Grimsby, has contributed a chapter on Peach Precooling.

Rural School Fairs, and Other Junior Work of the Ontario Department of Agriculture. This is a sixteen-page pamphlet reprinted from the Annual Report of the Ontario Experimental Union and containing an address delivered by Mr. W. B. Roadhouse, Deputy Minister of Agriculture, at the meeting of the Union early in the present year, and, as an appendix, the regulations governing school fairs and a sample prize list.

MANITOBA

Fattening, Killing and Dressing Chickens for Market, by M. C. Herner, B.S.A., Professor of Poultry Husbandry, Manitoba Agricultural College. Bulletin No. 7, of the Manitoba Farmers' Library, is a timely disquisition. It not only deals with the subjects enumerated in the title, but it has also something to say about the right kind for such purposes and on packing, shipping and exhibiting.

Farm Cost Accounting, by the late G. G. White, B.S.A., Professor of Rural Economics, Manitoba Agricultural College. That not only Manitoba, but also Canada, was bereft of a valuable life when Professor George G. White was killed in his tractor on October 10th, 1916, at his farm in La Salle, Man., is well proven by the contents and arrangement of this 52-page bulletin. It deals with a subject especially uppermost at this juncture in the minds of students of agricultural conditions and members of agricultural organizations, namely, farm management. President Reynolds of the College testifies to his appreciation of the work by announcing that, besides serving for general distribution, the bulletin will be used as a text book in farm accounting. Professor White has dealt with his subject in a thoroughly practical business-like way. After pointing out the competition from other countries that confronts the farmers of Canada he has told them that

the first necessity is to ascertain the cost of production. He next comments upon the fact that very few can say at the end of the year just how much has been made out of each branch of the farm and explains why this is so. He then speaks of the importance of keeping accounts and tells when and how the work should be done. To have a complete set of farm accounts, he says, only three records need to be kept, to wit:

1. An inventory of all assets and liabilities at the beginning and end of each business year.
2. A record of all money paid out and of all money received, showing the department of the farm affected.
3. A record of all the time, men, horses and equipment work on each branch or department of the farm.

Twenty-four pages are devoted to detailing, with examples, the system that should be followed. An appendix gives a copy of a supposititious financial record for last year. Expenditures and receipts are minutely marked down and the profits and charges worked out on every line. Having adopted the plan here set forth, the farmer will be able to tell to a cent how much his labour income amounts to—that is the amount remaining to his own credit after everything else has been accounted for. Methods for calculating quantities conclude a bulletin of much practical worth.

SASKATCHEWAN

Live Stock Commissioner's Report.—The fourth annual report of the provincial Live Stock Commissioner covers a period of sixteen months ending April 30th, 1916. It bears testimony to the fact that the last few years have been fruitful of significant federal and provincial legislative and administrative measures designed to foster agriculture, to improve the distribution and marketing of live stock and other agricultural products and generally to better rural life. It also observes: "Far removed from the scene of the deadly, devastating European struggle Canadian farmers are prosperous and enjoying the fruits of their labours without any threat of wholesale destruction of life and property. No wonder that observing men are optimistic concerning the agricultural situation and especially so concerning live stock." The report is decidedly optimistic in tone. It acknowledges the beneficial work being done by the Dominion Live Stock Branch and urges the retention of females of all live stock. It gives statistics regarding the existing situation, quotes prices for several years back, refers to marketing activities and to transportation matters, tells the story of enrolment under the Horse Breeders' Act, deals with the health

of animals, quotes in full the regulations regarding hog cholera and swine plague and gives the minutes of meetings held by the different provincial breed associations and the veterinary association.

BRITISH COLUMBIA

Fruit Growers' Association Annual Report. The twenty-sixth annual report of the British Columbia Fruit Growers' Association makes a pamphlet of 60 pages. It deals with the proceedings of the year ending December 31st, 1915, but includes a synopsis of the annual convention of the association held in Victoria, B.C., March 6th and 7th, 1916. Much practical information is contained in the various addresses recorded and delivered by leading members of the association and prominent Government officials, both federal and provincial.

MISCELLANEOUS

Demonstrations in Woodwork, by Clinton S. Van Deusen, M.E., Professor of Manual Arts, Ohio State Normal College, published by Manual Arts Press, Peoria, Ill., aims to give practical working directions for pupils in rural schools. The publication consists of a series of four-page leaflets, each describing by text and illustration the process of making one article of common use. There are three sets of eight subjects, the price for each set being 25c.

Woodwork for Beginners, by Ira S. Griffith, Chairman of the Manual Arts Department, University of Missouri, is another of the useful text books for young people of a mechanical or ingenuous turn of mind issued by the Manual Arts Press of Peoria, Ill. The present publication is a handy little volume of 80 pages that can be had for 50c. and that tells about the use of tools and how exactitude in workmanship can be acquired. A number of half-tone illustrations and line drawings help the student to appreciation and better grasp of the text.

Poultry Production, by William Adams Lippincott, A.B., B.S., Professor of Poultry Husbandry in Kansas State Agricultural College, published by Lea & Febiger, Philadelphia and New York, is a cloth bound volume of 517 pages and 234 illustrations, including a plate showing the geographical distribution of poultry in the United States. The work constitutes a thorough exposition of the breeding, raising, feeding, and preparation of poultry for the market and for the table, of the keeping and grading of eggs, of the advisable equipment for carrying on the industry, and of the diseases and pests, with remedies, to which fowl are subject.

Lippincott's Farm Manuals. Two more volumes of this series published by the J. B. Lippincott Company, of Philadelphia, have made their appearance. One entitled "Productive Farm Crops," prepared and written by E. G. Montgomery, M.A., Professor of Farm Crops, Cornell University, is a work of 501 pages and 203 illustrations. The author himself states that the text is intended for the use of students having some practical knowledge of crop production, and that it is hoped to meet the needs of such students in agricultural short courses, and secondary schools, as well as a considerable class of beginners in agricultural colleges. Being of a practical nature the book will also be found a handy book for farmers desiring a reference book covering all of the cultivated crops. The best methods of seed selection are presented, with statistics proving the value of careful selection. The latest scientific methods of disease and blight control are explained and the most practical means of harvesting and preserving each and every crop are discussed.

The second of these Manuals just to hand, entitled "Productive Feeding of Farm Animals," has for its author, F. W. Woll, Ph.D., Professor of Animal Nutrition at the University of California. It is a work of 385 pages with 105 illustrations. That two editions have had to be issued in as many years is of itself a tribute to its completeness and usefulness. The work is divided into three parts and an appendix. The first part deals with the principles of feeding farm animals, the second with feeding stuffs and the third with productive feeding. The appendix refers to the composition, the production value, and the manurial value of feeding stuffs. There are also given ready reference tables for calculation of rations, of feed units and weights of concentrated feeds.

Production of Baby Beef in Alberta is the

title of a 12-page pamphlet issued by the Canadian Pacific Railway Department of Natural Resources and prepared by J. G. Rutherford, C.M.G., Superintendent of Agriculture and Animal Industry for the company. Counsel and cost regarding breeding and raising are given along with statements of results achieved and information as to marketing. In the opening paragraph of the pamphlet, Dr. Rutherford, who was formerly Veterinary Director General for the Dominion, says: "One of the most striking features of the extraordinary progress made by humanity in the last hundred years is the development and steady improvement of our food-producing domestic animals. This is true of all kinds of stock, including the dairy cow, which in the matter of milk production has reached a degree of excellence undreamt of by previous generations. The modern bacon hog and the high quality mutton sheep certainly outclass in marked degree all their ancestors and predecessors."

Soils Laboratory Manual and Note Book by Eastman and Davis; published by the J. B. Lippincott Company of Philadelphia. This manual, compiled by J. F. Eastman, M. S., Professor of Agriculture in the New York State School of Agriculture at Morrisville, N.Y., and Kary C. Davis, Ph.D., Professor of Agriculture, Knapp School of Country Life, George Peabody College for Teachers, Nashville, Tenn., is intended for the use of students studying soils, whether they be in high schools, agricultural schools, or in colleges. Believing that the experimental method of studying soils serves to fix in mind their characteristics and the principles concerning their best management, the authors have outlined in complete detail, with suitable illustrations, some thirty-three exercises in the study of soils. Provision is also made throughout the book for the making of reports, and complete notetaking.

NOTES

At a recent sale of shorthorns at Banbury, England, 42 head sold for an average per head of \$980. Among the purchasers was H.R.H. the Prince of Wales, who gave \$3,000 for the bull Edgcote Count. The top price paid was \$4,250 for Edgcote Judge. At this sale 23 bulls averaged \$1,170 and 19 cows and heifers \$630. At another sale 49 shorthorns averaged \$750 a piece.

organize an Ovine Alliance to cover the whole of the country and to include every breed. It is proposed that the headquarters shall be in Chicago and that the organization meeting shall take place there at the time of the International Live Stock Show.

Strenuous efforts are being made to boom the sheep industry in the United States. Among other projects is one to

Mr. J. E. McLarty, B.S.A., has taken over the work of the Director of the Rural Science Department, Charlottetown, P.E.I. which had been during the past year in charge of Prof. S. B. McCready.

The Women's Institute of Essex county, Ontario, conducted a bird house contest among the school children during the past summer. Prizes were offered for the best bird houses made by the pupils. Both boys and girls competed and the second prize was won by a girl. Many pupils competed in the contest and placed their houses in the trees about their homes.

Mr. Morley Pettit, the Provincial Apiarist for the province of Ontario, has pointed out that the paragraph appearing on page 937 of the October GAZETTE with respect to the honey crop had reference only to dark honey gathered by a comparatively small number of beekeepers late in the fall. This information was intended to be supplementary to the report which appeared on page 843 of the September issue of this magazine.

In 1915 about 90 tons of peaches were packed in gallon tins at the Ontario Horticultural Experiment Station, Vineland; this year 140 tons of peaches, 15 tons of plums, 7 tons of apples, as well as over 15 tons of strawberry, raspberry and black currant jams have been sealed in over 50,000 gallon tins. A considerable proportion of this canned fruit has been donated each year by the Ontario Department of Agriculture to the military hospitals.

The mutton deficiency of 1914 in the United States was eight million pounds, in 1915, twelve million pounds. In other words, instead of a surplus of mutton there was a shortage. And this thing will continue unless there is a halt to the marketing of female stock. We have got to stop slaughtering ewe lambs, it is positively wicked under present conditions. People are hungry for breeding sheep. Really it's a capital crime to send ewe lambs to the shambles.—*American Sheep Breeder*.

Uruguay is not one-third the size of Ontario, and contains less than half the population, yet Uruguay in 1908 harboured 26,000,000 sheep and 9,000,000 cattle, while Ontario in 1911 had only 922,375 sheep and 2,604,628 cattle. The Argentines have less than a third of the acreage of Canada and a population of about the same. Canada in 1914 had 6,036,817 cattle and 2,058,045 sheep. The Argentines had 29,500,000 cattle and 80,000,000 sheep.

Where the production of meat for human consumption is chiefly local the municipal abattoir must in this day be considered an important public necessity. In view of the fact that the flesh of animals bulks so largely in the people's daily bill of fare it is only reasonable that some sort of guarantee should be forthcoming that it is not only what it professes to be—whether beef, mutton or pork—but also that it has been killed and handled in a sanitary fashion, and subjected to inspection which guarantees that it is wholesome. The modern municipal abattoir properly controlled and conducted should largely solve this problem.—*Breeders' Gazette*.

John Wrightson, a prominent British Agriculturist, in an article in *The Farmers' Magazine* states: "It is computed that there are 4,100,000 cows in Great Britain, requiring about 12,000,000 acres of pasture, and yielding 1,723,000,000 gallons of milk, of which about 620,000,000 gallons are consumed as fresh milk—the remainder being disposed of in calf-rearing, butter and cheese making, and the manufacture of condensed milk. The potentialities of the trade are shown by the fact that, vast as this amount may appear to be, it only represents an annual consumption of 15 gallons per head of the population, or .33 pints per day, per head."

Under the Smith-Lever Act much work is being done in the United States similar to the work promoted and encouraged by THE AGRICULTURAL INSTRUCTION ACT in Canada. A recent innovation in the North and West under the former Act is the appointment of women field agents, whose duty is, as a speaker at a conference of workers of the States Relations Service at Washington, D.C., put it, "to lighten the labours of farm women and to help them to make their lives fuller and more satisfying." In the south the system has been longer in operation, approximately 60,000 girls and 30,000 women being reached by 462 agents. In the north and west the first Federal woman agent was appointed in April this year and the majority of the 14 now employed have only been in the service since July 1st. At the conference referred to it was pointed out that the home economics work had been built on the foundation laid by specialists of the extension departments of the state agricultural colleges. The county women agents are co-operative agents of the agricultural colleges, the United States Department of Agriculture supplying the funds under the Smith-Lever bill to meet the expenditure involved.

Gumbo is a very heavy clay of rather peculiar characteristics. When wet, it is so sticky that it defies the operation of any farm implement. Upon drying, it bakes so thoroughly that deep cracks are formed and the soil between becomes as solid blocks. It must be worked at just the right stage or it cannot be worked at all. Yet it is known that gumbo contains all of the necessary elements of plant food in abundance and produces excellent crops when properly handled. According to Dr. J. K. Kutnewsky, principal of the South Dakota State School and Farm for the Feeble-minded, alfalfa is the very best crop for gumbo soil. It thrives well on this type of soil and produces a valuable crop of forage. At the same time, when once well started, the roots force themselves down through gumbo and hardpan and open up the soil as nothing else will. "Give an alfalfa crop four years on gumbo soil," said the Doctor, "and it will do away with the gumbo."

There are at this time approximately 1,350 active home-economics clubs in the northern and western states, with an approximate total membership of 27,000. The agricultural colleges are active in furnishing monthly progress for those clubs. The visits of state specialists to these clubs are necessarily few, however, and instruction by such means can not reach a large number of women. Realization of this has brought about in many counties a demand for county women agents who may devote more time to the work. Where such agents have been provided, their work has been taken up with enthusiasm by the farm women. The women agents are working through clubs, the granges, and schools, calling for assistance when necessary on the state agricultural colleges and the specialists of the Federal Department of Agriculture. The men and women county agents are co-ordinate, but co-operate and advise with each other freely.—*Washington Weekly News Letter.*

There is one element of the farming population which in particular should receive sympathetic consideration. It is a class which is in the minds of most of us when we are thinking about the acuter agricultural problems. Too frequently they have little or no collateral and are not good farmers, or, at least, not good business farmers, and too often at the close of the year's operations they have little or nothing left over and move on to try their fortunes in some other community. With a relative low standard of living, inferior producing ability, usually cultivating the less satisfactory land, they not infrequently find themselves in the hands of the more exacting landlord or merchant.

We must do for this class zealously what we are trying to do for the whole farming population. Their problems can be reached only by fundamental alterations, reached through educational methods, better schools, better health arrangements, better farming methods, and better marketing. . . . *David F. Houston, Secretary for Agriculture, Washington, D.C., in The Banker-Farmer.*

The first co-operative laundry in the world was started at Chatfield, Minnesota, in December, 1912. The proposition received its birth at a picnic held by a Progressive Farmers' club. Within a few days three thousand dollars' worth of stock was sold to 224 shareholders, the shares being \$5 apiece. About 30 percent of the stock is held by citizens of Chatfield and 70 percent by farmers in the vicinity. An annex 30 by 70 feet was built to the local creamery at a cost of \$2,000 by the creamery company and rented to the laundry company for \$15 a month. Five cents per pound is charged for small washings. Work that cannot be ironed in the mangle is washed, dried, starched, folded and sent out in that shape unless otherwise specially ordered. About 150 complete washings are done each week. The receipts for the first year were \$5,403, of which 70 percent was paid out in wages and a rebate of 10 per cent made to patrons. Shareholders received a dividend of 6 per cent.

In connection with pig-club work in the United States, various methods of financing the members have been contrived. Banks, business firms, chambers of commerce and individuals have voluntarily loaned to reliable pig-club members on their personal note, at small rate of interest, sufficient money to buy the necessary young pigs. A plan that is highly commended is "the endless chain method," whereby the money which is made available for lending to pig-club members is used to purchase a number of good young registered gilts from reliable breeders. These gilts are lent to the boys recommended by the county agent or by a special committee for that purpose, with the distinct understanding that they are to be raised according to instructions furnished by the pig-club agent or county agent, and are to be bred to a registered boar of the same breed. When the litter is weaned, two choice gilts are to be returned to the man furnishing the sow, after which the sow and the remainder of the litter become the property of the pig-club boy. The two gilts are in turn lent to two other pig-club boys, and in this way the number of pigs is constantly increasing.

INDEX TO PERIODICAL LITERATURE

- The Saturday Press and Prairie Farm*, Saskatoon, Sask., Nov. 11, 1916.
Municipal Hail Insurance, J. B. Mus-selman, Central Secretary of the Sas-katchewan Grain Growers' Association, page 8.
- The O. A. C. Review*, Guelph, Ont., October, 1916.
Fitting Sheep for the Fall Fairs, D. E. McEwen, '18, Nov. 1916, page 31.
The Production of Pure Seed in Cana-da, L. H. Newman, Ottawa, page 63.
Canadian Crown Field Root, Vegeta-ble and Flower Seeds, George H. Clark, Seed Commissioner, Ottawa, Ont.
- The Journal of Agriculture and Horticulture*, Quebec, Nov. 1, 1916.
Small Fruit Packages and Packing. An address given by C. W. Baxter, Chief Fruit Inspector, Dominion Fruit Division, Ottawa, at the Summer Meeting of the Quebec Pomological Society, held at La Trappe, September 6th and 7th, page 96.
School Fairs, J. E. McOuat, page 99.
The Agricultural Merit Competition, page 101.
Poultry Work on the Experimental Farms, by F. C. Elford, Dominion Poultry Husbandman.
- The Farmers' Advocate*, London, Ontario, Oct. 26, 1916.
An Experimental Fruit Farm in An-napolis Valley, page 1766b.
- The Farm and Ranch Review*, Calgary, Alta., Nov. 6, 1916.
The Future of Farming, Scientific Stock Breeding, Professor James Wil-son, page 800.
Plain Talk on Agricultural Co-opera-tion, T. A. Benson, Dominion Poultry Representative for Alberta, page 798.
- Farm and Dairy and Rural Home*, Toronto, Ont., Nov. 2, 1916.
Common Grades, High Grades and Pure-Breds, Compares by G. H. Hut-ton, Superintendent, Lacombe Experi-mental Farm, page 1061.
- The Canadian Countryman*, Toronto, No. 11, 1916.
Is Cheese or Butter Making Profitab-le, Professor H. H. Dean, page 1411.
- Canadian Finance*, Winnipeg, Man., Nov. 1, 1916.
A Practical Plan for Land Settlement, Turning Casual Labour to Perman-ent Production, page 715.
- The Canadian Poultry Review*, Toronto, Ont.
Canada Should Produce More Eggs, F. C. Elford, Dominion Poultry Hus-bandman, page 421.
- The Agricultural Journal*, Victoria, B.C., November, 1916.
Many Applications have already been Made for Loans. Agricultural Credit Commission Has Provided Many Far-mers With Money for Improvements. Hon. Wm. Manson, Superintendent, Agricultural Credit Commission of British Columbia, page 146.
- The Canadian Horticulturist and Beekeeper*, Toronto, Ont., Nov. 1916.
The Expeditious Handling of Basket Fruit, Edwin Smith, B.S.A., formerly in Charge of Fruit Cold Storage and Transportation Investigation, Grims-by, Ont., page 263.
The Triumph of Efficient Methods, W. E. Biggar, Chief Provincial Fruit Pests Inspector, Hamilton, Ont., page 261.

The normal child is of an enquiring turn of mind, and if properly directed, quickly becomes interested in nature, in the common things of the neighbourhood, which are inseparably linked up with life in the country. It is education for the great majority. "Nature is never special, and a knowledge of her laws may form a sound Grecian founda-tion upon which to build the superstructure of a life as useful to the state, and as satis-fying to the inner needs of a man, as if the groundwork were classics and literature. The two, indeed, cannot be separated."—W. R. Reek, B.S.A., in Report, P.E.I. Department of Agriculture.

THE AGRICULTURAL GAZETTE OF CANADA

INDEX TO VOLUME III

	Page
Acre Profit Competitions in 1915	141
Agriculture, Activities of the Saskatchewan Department of	1000
Federal Appropriations for, 1915-16	501
First in Canada	125
In Quebec, The Progress of	138
In Canada	414, 518, 609, 700, 799, 870, 958, 1061, 1071
In High Schools	1105
At Fairs and Exhibitions, The Teaching of	890
At Toronto Exhibition, Education In	905
Agricultural College Appointments, British Columbia	614
Manitoba	1000
Graduates	654
Library and Its Opportunity, The	766
Truro, Nova Scotia, The	815
Credit in British Columbia	1092
Credits	244
High Schools	1002
Instruction Act, The	776
Accomplishments under the	592
Appropriations under, to the Provinces, The	501, 777
and the Rural School	775
Instruction Among Non-English People	447
Training for	855
The Training of Teachers For	916
Legislation	435, 551, 831, 1087
Legislation in 1916	1031
Literature Suitable for the School Library, A Simple Method of Cataloguing	466
Meteorology in Canada	177
Posters, Popular	447
Products, Grading of	348
Research in Canada	648
School for Eastern Ontario, An	899
War Book, The	397
Alfalfa Hybridization	445
The Inoculation of	213
Seed Production and Inoculation	336
Annex to the Oka Agricultural Institute, The	893
Animal Contagious Diseases Act Amended, The	32, 117, 230, 409, 515
Annual Crops at Saskatoon, Sequence of	152
Apple Box Competition at the Oka Agricultural Institute	55
Insects in the Province of Quebec, Controlling	697
Packing, Instruction in	309
Production in Ontario in 1915	516
Situation in Eastern Canada, The	954
Trade, Export	308
Apples in Great Britain, The Sale of Canadian	1052
Arsenate of Lime in Combination with Soluble Sulphur as a Spray Material for the Apple	305, 403
Associations and Societies,	
Alberta Horse Breeders' Associations	575
Canadian Hackney Horse Society	288, 659
Canadian Percheron Horse Breeders' Association	659, 1110
Canadian Pony Society	288, 659
Canadian Thoroughbred Horse Society	288

Associations and Societies,

	Page
Canadian Clydesdale Breeders' Association	288, 658
Canadian Shire Horse Breeders' Association	288, 659
Canadian Standard Bred Horse Society	288
Ontario Horse Breeders' Association	288
Alberta Cattle Breeders' Association*	478
Ayrshire Clubs in Canada	661
Brant Shorthorn Club	661
Canadian Ayrshire Breeders' Association	289, 657, 844
Canadian Red-Polled Association	192
Canadian Hereford Breeders' Association	288, 656
Canadian Holstein-Friesian Association	96, 100, 289, 656, 660, 843
Canadian Jersey Cattle Club	289, 658
Canadian Guernsey Breeders' Association	289
Canadian Brown Swiss Association	289, 658, 662
Canadian Aberdeen Angus Association	379
Cattle Breeders' Clubs	660
Dominion Cattle Breeders' Association	289
Dominion Shorthorn Breeders' Association	288, 656
Alberta Sheep Breeders' Association	193
Dominion Sheep Breeders' Association	289, 658
Ontario Sheep Breeders' Association	289
Alberta Swine Breeders' Association	193
Dominion Swine Breeders' Association	289
Ontario Berkshire Breeders' Association	289, 658
Ontario Swine Breeders' Association	289, 658
Ontario Yorkshire Breeders' Society	289, 658
Alberta Live Stock Associations	382, 934
Alberta Live Stock Association (Sale of Bulls)	575
British Columbia Stock Breeders' Association	284, 481
Co-Operative Live Stock Associations	383
General Stock Breeders' Association of Quebec	186, 378
Interior Stock Raisers' Association of British Columbia	284
Manitoba Live Stock Associations	192
National Live Stock Week, The	287
National Live Stock Records Board	290, 576, 660
Saskatchewan Live Stock Associations	447
Saskatchewan Live Stock Convention	934
Saskatchewan Stock Growers' Association	663
Western Stock Growers' Association	96
Alberta Poultry Association	96, 286
British Columbia Poultry Association	193
Brandon Poultry Association	96, 186
Manitoba Poultry Congress	381
New Brunswick Poultry Association	285, 377
Nova Scotia Poultry Association	285
Prince Edward Island Egg and Poultry Association	475
Western Ontario Poultry Association	96
Alberta Dairymen's Association	193
British Columbia Dairymen's Association	1110
Eastern Ontario Dairymen's Association	96, 189, 933
Manitoba Dairy Association	186, 381, 1110
New Brunswick Farmers' and Dairymen's Association	284, 376
Pacific Northwest Associations of Dairy and Milk Inspectors	664
Prince Edward Island Dairymen's Association	186, 376
Saskatchewan Dairymen's Association	97, 192
Western Ontario Dairymen's Association	96, 190, 1017
British Columbia Bee-Keepers' Association	481
County Bee-Keepers' Associations in Ontario	476
Manitoba Bee-Keepers' Association	186, 380
New Brunswick Bee-Keepers' Association	476
Ontario Bee-Keepers' Association	99, 843, 1017
Quebec Bee-Keepers' Association	188, 1017

Associations and Societies,	Page
British Columbia Fruit Growers' Association.....	479
Nova Scotia Fruit Growers' Association.....	96, 188, 284
Ontario Fruit Growers' Association.....	286
Quebec Pomological and Fruit Growing Society.....	97, 933, 1017
Canadian Seed Growers' Association.....	662, 842, 842
Manitoba Seed Growers' Convention.....	379
New Brunswick Potato Growers' Convention.....	476
Ontario Vegetable Growers' Association.....	286, 1017
Western Ontario Seed Growers' Association.....	377
Manitoba Grain Growers' Association.....	96, 286
Ontario Corn Growers' Association.....	96, 186, 385
Saskatchewan Grain Growers' Association.....	96, 382
Alberta Agricultural Fairs Association.....	478
Alberta Winter Fair.....	97
Eastern Ontario Winter Fair.....	663
Manitoba Winter Fair and Fat Stock Show.....	186, 1110
Maritime Winter Fair.....	1017
Ontario Fair and Exhibitions' Association.....	290
Ontario Winter Fair.....	97, 377
Ottawa Winter Fair.....	191, 663, 1017
Saskatchewan Winter Fairs.....	186, 663
Saskatoon Winter Fair.....	186
Toronto Fat Stock Show.....	1017
British Columbia Farmers' Association.....	480
Dominion Grange, The.....	290
Farmers' Week in Winnipeg.....	379
Nova Scotia Farmers' Association.....	96, 284, 1017
Prince Edward Island Central Farmers' Institute.....	187
United Farmers' Association of Ontario.....	290
United Farmers' Co-operative Company.....	186, 290
Ontario Ploughmen's Association.....	286, 1110
Sherbrooke County, Quebec, Ploughmen's Association.....	97
Canadian Forestry Association, The.....	187
Manitoba Horticultural and Forestry Association.....	96, 381
British Columbia Entomological Society.....	480
Ontario Entomological Society.....	844, 1017, 1111
Alberta Veterinary Association.....	186
Quebec Veterinary Society.....	1110
British Columbia Veterinary Association.....	1112
Central Canada Veterinary Association.....	96, 187
Manitoba Veterinary Association.....	284
Canadian and International Good Roads Congress.....	96
Good Roads.....	383
Alberta Women's Institutes.....	478
Agricultural Credit Society, An.....	1017
Breed Society Grants to Fairs.....	656
Canadian Kennel Club.....	290
Canadian Society for the Protection of Birds.....	383, 1018
Manitoba Agricultural Societies' Convention.....	380
New Brunswick Societies, The United.....	1017
Manitoba Home Economics Convention.....	382
Ontario Agricultural and Experimental Union, The.....	188
Ontario Horticultural Association.....	1111
Ontario Rural Workers' Conference.....	377
Ontario Women's Institutes.....	1112
Prince Edward Island Development Commission.....	475
Quebec Maple Sugar Association.....	378
Quebec Society for the Protection of Plants.....	378
Southern Alberta Wool Growers' Association.....	478
School Garden Association of Saskatchewan.....	663
Western Canada Irrigation Association.....	98, 844

	Page
Audubon Societies, The National Association of.....	182
Bacon Cured in Canada, American.....	408
Hog Contest.....	563
Industry, The.....	887
Bacterized Peat or Humogen.....	10, 436
Bank Assistance to Agriculture.....	92, 179
Bee Division, Central Experimental Farm, Recent Work of the.....	1041
Bee-Keeping, Spring Report On.....	565
Bees at the Dominion Experimental Farms in 1915, Results from.....	594
Beef Demonstration, A.....	93
Better Farming Trains, The.....	568, 828, 909
Bird Life, The Preservation of.....	472, 573
Birds, The Canadian Society for the Protection of.....	1018
Birds in Canada, The Protection of Migratory.....	1032
Black, W. J., The Appointment of.....	680
Blue Bird Bazaar, A.....	374
Boards of Agriculture.....	439
Book Reviews.....	102, 197, 294
Boys' and Girls' Clubs or Junior Farmers' Institutes.....	157, 826
Contests in Saskatchewan.....	1005
Clubs in the United States.....	1016
Breed Society Grants to Fairs.....	656
Broadview Boys' Fair.....	89, 1007
Brown-tail and Gipsy Moths, The Introduction and Establishment in Canada of the.....	20, 111
Natural Enemies of the.....	22
Brown-tail Moth in New England for Colonization in Canada, Rearing the Parasites.....	789
of the.....	511
Butter, Decrease in the Imports of.....	1091
in the Prairie Provinces, Grading Creamery.....	
to England, Exporting.....	
Canada at San Diego.....	208
The Call of.....	591
Cattalo Herd Established, A.....	208
Cattle, Loans for Buying.....	1107
Cattle Breeders' Clubs.....	660
Industry, Development and Importance of, The.....	791
Slaughtered, The Sex of.....	230
Sheep and Swine, Comparative Value of Concentrated Protein Meals for.....	687
Dairy.....	860
Central Canada Exhibition, Experimental Farm Exhibits at.....	110
Cereal and Agrostology Building, The New.....	964
Cheese Factory and Creamery Instruction and Inspection.....	567
Factories Busy, Manitoba.....	55
Competition at the Oka Agricultural Institute, Apple Box.....	346
Boys Turnip-Growing (Nova Scotia).....	145
Feeding Hogs for Profit (Ontario).....	141
Competitions in 1915, Acre Profit.....	257
for Boys and Girls.....	221
Conference of Dairy Recorders.....	932
for Rural Leadership at Edmonton.....	206
Conservation of Breeding Cows, the.....	955
and Feeding Cattle in the Western Provinces.....	362
Consolidation of Rural Schools, The.....	367
of Schools in the United States, Progress of.....	634
Co-Operative Associations, Work of.....	93
Selling.....	368
Cost of Living, The.....	373
County Agent in United States, The.....	181
Improvement League, A.....	221
Cow-Testing Associations, Spread of.....	406
The Out-look for.....	790
Growth In.....	913
Work in British Columbia.....	633
Cows Distributed in Manitoba, First Lot of.....	635
Cream Buying Stations, Legislation Governing.....	993
Creameries Booth at the Provincial Exhibition, Halifax.....	

	Page
Creelman, S. D., No. 998, Saskatchewan	1004
Crop, in the Prairie Provinces, The.....	94
Production in 1915.....	33
Cunningham, Thomas H.....	308
Dairy Herd at Ste. Anne de la Pocatière, The.....	56
Inspectors in Convention.....	563
Instruction Car.....	449
Products, Inspection of.....	510
Products, Transportation of.....	953
Recorders, Conference of.....	221
School, Ontario Agricultural College, The.....	47
Eastern Ontario, The.....	50
Statistics for 1915.....	627
Tests, Three day	95
Dairying Lecture Train, A.....	156
in Prince Edward Island and Nova Scotia.....	693
The Value of Instruction in.....	943
District Representative Leaflet, Ontario	45
Representatives' Conference.....	903
Representatives in Manitoba, More.....	448
Notes from.....	43, 147, 349, 443, 560, 740
Offices, The Selection and Equipment of.....	236
Drainage Work for 1916 in Ontario	441
Dry Farming Congress	1091
Duff, The Late Honourable, Minister of Agriculture	1089
Duty of the Dominion, The.....	269
Economic and Development Commission, The	92
Educational Exhibits at Fall Fairs.	812
Efficiency, To Promote.....	205
Egg Exhibit at Calgary	695
Laying Contest, Victoria, Fifth International	1092
Situation, The	867
Eggs, The Production of Abnormal	375
and Poultry, An Illustration of Successful Co-operation in the marketing of ..	124
Elementary Agricultural Instruction	60
Agriculture, The Teaching of	472
Embargo on Fruit, Great Britain's	603
Examinations at The Oka Agricultural Institute	745
Experts Leave Us, Why.....	185
Extension Work.....	622, 635
Farm Boys' Camp in Saskatchewan.....	57, 828
Farm Chickens, Co-operative Fattening of	823
Farm Drainage.....	325, 441
Houses, Farmers' Wives Asked to Plan	567
Labour	245, 351
Management Demonstration Work.....	474
Management Demonstrations in the United States.....	1008
Mechanics	731
Products, The Marketing of	183
Production in 1915, The Value of.....	231
Farmers' Agricultural Union, Quebec.....	258
Farmers' Automobile Tours	989
Farmers' Field Days and Excursions.....	944
Farmer's Poultry House, The	682
Farmers' Week in Winnipeg	379
Feeders and Stockers, Exporting	999
Fibre Division, The	788
Field Officer, Appointment of	307
Field Root Seed Growing, Experimental Work With.....	786
Field Root Seed Production	807, 842
Field Root and Vegetable Seed	30
Flax Industry, The	302
Flax Fibre in Ontario, The Production of.....	375
Foot and Mouth Disease.....	407
Imports of Animals, etc., Orders Respecting	515

	Page
Forest Insect Investigation in Stanley Park, Vancouver, B.C.	794
Fruit, Advertising Canadian.....	729
Fruit Crop of 1915, The.....	26
Meetings.....	412
Packing School at Duncan, B.C.....	157
Pests, Inspection of	452
Prospects in Canada	413, 790
Season, 1915-16, Notes Regarding.....	228
Fruits for Precooling Shipments, Maturity of	18
Fruits, Inspection of Small.....	413
Foul Brood Inspection.....	453
Girl Guides, The	746
Graduates of the School of Agriculture, Ste. Anne de la Pocatière.....	745
Grain Rust in the Prairie Provinces, The.....	861
Hail Insurance, Additional.....	829
Harrow Tobacco Station, Experiments at	684
Hen, The Profit-Making.....	453
Hog Cholera.....	407
Home Economics' Societies, The.....	352
Home Garden Contest, A	643
Home Labour-Saving Devices.....	431
Home School Gardens.....	638
Honour Roll, Dominion Department of Agriculture	1058
Horse Industry, The.....	660
Horticulture at the Dominion Experimental Station, Morden, Manitoba.....	502
Household Science Short Courses, The.....	572
The Teaching of	1093
Ideal Rural School, The.....	764
Importations from Illinois.....	696
Index to Periodical Literature, 104, 200, 296, 391, 488, 584, 673, 769, 850, 938, 1026, 1119	
Indians, Good Farming and Gardening Competitions for.....	372
Industrial Farm System, The	341, 434 623
Insect and Pest Act, The Destructive	952
Insect Pests in the Orchards on The Indian Reserves in British Columbia, The	
Control of	856
Inspection Statistics.....	517
Intermittent Discharge of Fluids from Septic Tanks, The	841
International Institute of Agriculture and the War, The.....	27
James, The Late C. C.	590
Japan, The Agricultural Development of.....	1013
King System of Ventilation, The.....	615
Land Purchase in Denmark, Co-operative.....	370
Levis Animal's Quarantine Station, The	118
Lime as a Fertilizer	333
Live Stock Breeders, Encouragement to	123
Buildings, The Ventilation of.....	598
Distribution.....	154
Industry, The Future of.....	5
Judging Competitions, Ontario Inter-County.....	45
and Poultry Organizations, Grants to.....	546
Short Courses, 1915-16.....	442
Macdonald College Exhibit at Sherbrooke Fair.....	995
Mantle Killed in Action, Deputy Minister	1000
Maples to Mark Canadian Graves in France, Canadian.....	1038
Model Kitchen, The.....	748
Mange Area.....	407
Mangel Seed, The Production of.....	808
Manitoba Grain Growers' Convention, The.....	286
Maple Sugar and Syrup Industry, The.....	261, 742
March Fly (Bibio abbreviatus) in Grain Fields and as a Pest of Celery, The.....	600
Marketing Problem, The.....	28

Marketing and Shipping, Co-operative.....	354
Minister of Agriculture in British Columbia, The New.....	830
Motor Car in District Representative Work, The.....	986
National Wealth vs. Plant Diseases.....	211
Nineteen Hundred and Fifteen and Nineteen Hundred and Sixteen.....	109
Notes..... 150, 198, 294, 388, 484, 566, 769, 848, 937, 1024, 1116	815
Nova Scotia Agricultural College, The.....	1083
Nursery Stock, The Inspection of.....	1046
Nursery Stock Under Federal Legislation, The Fumigation and Inspection of.....	419
Pasture Crops in the Prairie Provinces.....	267
Patriotic Acre Scheme, The.....	222
Peach Package Tests, Season of 1915.....	121
Peach Precooling.....	946
Pear Thrips in British Columbia and its Control, The.....	10, 436
Peat or Humogen, Bacterized.....	789
Pepsin as a Substitute for Rennet in the Manufacture of Cheese.....	261
Physics Building, O. A. C., Guelph, The New.....	211
Plant Diseases vs. National Wealth.....	827
Ploughing Match Rules.....	1036
Potato Export Trade, The.....	353
Potato Planter, A.....	6
Trade with the United States Re-established.....	564
War Plot Fund, Children's.....	303
Potatoes, Seed.....	1057
for 1911 Seed.....	784, 842
By Hill Selection, Improvement of.....	372
The Best Varieties of.....	810, 901
The Hill Selection of Seed.....	210
Scarcity of Seed.....	260
Poultry Association for the Province of Quebec, A.....	139
Breeding, Teaching.....	681, 709
Houses, The Ventilation of.....	998
Market Situation in Manitoba, The.....	156
Marketing.....	907
Marketing Stations, Co-operative.....	149
Shows, Seed Fairs and.....	1090
Prairie Fowl, Protection of.....	575
Prize Awarding, New System of.....	301, 494
Production and Thrift.....	687
Protein Meals for Dairy Cattle, Sheep and Swine, Comparative Value of Concentrated.....	451
Publications Branch Formed, A (British Columbia).....	1113
New..... 100, 194, 291, 385, 481, 577, 664, 767, 845, 935, 1020, 1113	473
Public School Cow, A.....	1018
Pure Bred Live Stock, Sales of—Quebec.....	1019
—Ontario.....	1019
—Alberta.....	765
Rainfall, The Unusual.....	409
Rams and Boars to Farmers' Associations, Statement with Respect to the Loan of.....	865
Raspberries, Precooling of.....	513
Record of Performance, The.....	508
Refrigerator Car Services, Special.....	830
Regina Exhibition, The.....	58
Registered Seed Distribution in British Columbia.....	221
Rennet Extract, High Cost of.....	607
in Cheese Making, Substitutes for.....	542
Road Drag Competitions.....	892, 894
Root Seed, Production of.....	154
Royal Commission on Live Stock, The.....	462
Rural Education Associations.....	89, 1007
Fair in City Limits, A.....	493, 525, 636, 747
Highways.....	884
Life Conferences.....	

	Page
Rural Ministers, Short Courses for	633
Organization.....	992
School Improvements, Suggestions for	1006
Reform.....	185
The Ideal.....	764
With Ten-Acre Grounds, A.....	763, 1004
Workrooms.....	369
Schools, The Consolidation of.....	362
Science Summer School.....	838
Survey in Manitoba.....	566
Workers' Conference, Ontario	377
Russian Government Agricultural Agency.....	185
School Fairs.....	77, 141, 281, 629, 1014
Fairs for 1916	454
Garden at Ottawa.....	1016
Garden Organization, A.....	459
Garden Plans for 1916	355
Gardens.....	158
Association of America	1088
Home.....	589, 638
Grounds, The Beautification of.....	270
Schools Day in Saskatchewan, Better	839
Science Building at Nova Scotia Agricultural College, The.....	254
Opening of the.....	136
The Teaching of.....	184, 468
Seed Corn in the Ear, New Control System for Marketing.....	226
Distribution in British Columbia, Registered.....	58
Fairs.....	714
and Poultry Shows	149
and Crop Improvement.....	679
and Seed Selection	821
Subventions Paid to	698
Grain Exhibition, The Sixth Provincial	259
Fairs in Manitoba.....	825
The Grading of.....	957
Investigation, Paper Packet.....	604
Testing, 1915-16	403
Septic Tanks, The Intermittent Discharge of Fluids from	841
Sewage Disposal in Rural Districts.....	840
Shade Tree Insects of the Canadian Prairies, Injurious	215
Spraying, Demonstrations in.....	634
Sheep and Swine, Sale of Pure-Bred, (Macdonald College).....	997
Raising in Ontario, Encouragement to.....	998
Short Course in Apiculture (Ontario).....	146
Object of the.....	94
The Teachers' Winter (New Brunswick).....	282
Schools (Alberta).....	450
at Weyburn.....	323
Courses.....	310
for Ministers.....	663
in Agriculture.....	260
1915-16, Live Stock (Ontario).....	442
The Household Science (Prince Edward Island).....	572
Shuttleworth, The Late Arthur C.....	214
Soil Moisture Tests.....	156
Staff, Changes in.....	504
Stallion Enrolment in 1915.....	186
Stem Maggots Attacking Growing Grain, Some.....	504
Stevenson, Dr. J. O., Successor to Prof. Reynolds.....	822
Student Enrolment, 1916-17.....	1108
Straw, The Feeding Value of.....	781
Summer School for Teachers.....	569, 925
Sweet Clover	130
As a Honey Plant.....	132
Swine, Contest in the Raising and Feeding of.....	268

	Page
Thoroughbred Stallion from the Royal Stud, A.....	410
Tobacco Soils in Canada, Studies of.....	595
Timothy Seed Shipments.....	864
Tuberculosis.....	407
in Saskatoon, Control of Bovine.....	309
Turnip Growing Competition, Boys'.....	346
Seed, The Growing of.....	256
University Agricultural Work in British Columbia, Notes on The.....	831
Water Supplies and Sewage Disposal for Suburban and Farm Premises.....	651
Weed Control.....	249
Inspectors at Claresholm, Convention of.....	746
Question, Live Interest in Manitoba.....	633
Weeds Commissioner Active in Manitoba.....	566
Noxious.....	449
The Crusade Against.....	827
Wheat Problems, Canada's.....	1106
Women's Institute Conferences.....	452, 885, 1104
Institutes, Demonstration-Lecture Courses for.....	264
Institute Meetings, Summer Series of.....	443
Wool, Co-operative Marketing of.....	880
Exhibit, The.....	512, 1056
for Market, Assistance to Wool Growers' Associations in Grading and Classi- fying.....	411
Grading Operations, 1916, Preliminary Report of.....	868
Will Market Co-operatively.....	352
Wool in the Fleece at Canadian Fairs, Prizes for.....	1055
Work Projected for 1916, Outline of.....	400
Vacant Lot Garden in Ottawa.....	574
Vegetable, Seeds in 1915, Experiments in Growing.....	11
Seed, Field Root and.....	30
Seeds, The Production of.....	126
Ventilation of Live Stock Buildings, The.....	598, 615
Poultry Houses, The.....	681, 709
Vocational Education in the United States.....	1016

AUTHOR'S INDEX

A.

ARCHIBALD, E. S., B. A., B. S. A., Dominion Animal Husbandman:—	
Comparative Value of Concentrated Protein Meals for Dairy Cattle, Sheep and Swine.....	687
ARKELL, H. S., M.A., B.S.A., Assistant Live Stock Commissioner:—	
Development and Importance of the Cattle Industry.....	791
ARKELL, T. REG., B.S.A., B.Sc., In Charge of Sheep Division, Live Stock Branch:—	
Statement with Respect to the Loan of Rams and Boars to Farmers' Asso- ciations.....	409
Assistance to Wool Growers' Associations in Grading and Classifying Wool for Market.....	411
Wool Exhibit, The.....	512, 1056
Preliminary Report of Wool Grading Operations, 1916.....	868
Prizes for Wool in the Fleece at Canadian Fairs.....	1055
ARMSTRONG, E. M., Commissioner of Public Works and Mines, Nova Scotia:—	
The Industrial Farm System.....	434
AULD, F. H., Acting Deputy Minister, Department of Agriculture, Sask.:—	
Crop Production in 1915.....	39
Selection and Equipment of District Representatives' Offices, The.....	244
Grants to Live Stock and Poultry Organizations.....	549
Agriculture in Canada.....	700
Farm Boys' Camp.....	828
Cheese Factory and Creamery Instruction and Inspection.....	981
Motor Car in District Representative Work, The.....	991

B.		Page
BAILEY, C. F., B.S.A., Assistant Deputy Minister, Ontario Department of Agriculture:—		
*Inter-County Live Stock Judging Competition		45
*School Fairs	81,	629
Acre Profit Competitions in 1915		141
*The Selection and Equipment of District Representatives' Offices		241
*Children's Potato War Plot Fund		564
*A Home Garden Contest		643
Motor Car in District Representative Work, The		988
BARTON, H., Professor of Animal Husbandry, Macdonald College:—		
Sale of Pure-Bred Sheep and Swine		997
BARR, GEORGE H., Chief, Dairy Division, Dairy and Cold Storage Branch:—		
Grading Creamery Butter in The Prairie Provinces		511
Dairying in Prince Edward Island and Nova Scotia		693
BATES, FRED W., B.A., M.Sc., Director of School Agriculture, Saskatchewan:—		
*A School Garden Organization		459
Home School Gardens in Northern Saskatchewan		645
BATHO, GEORGE, Editor Agricultural Publications, Manitoba Department of Agriculture:—		
Seed Fairs and Poultry Shows		149
*Short Courses		319
Agriculture in Manitoba		870
BONAVIA, WM. J., Secretary, B.C. Department of Agriculture:—		
Home Labour-Saving Devices		433
BELANGER, E., Journal d'Agriculture, Quebec:—		
The Bacon Industry		887
BOURBEAU, ELIE, Inspector General of Cheese Factories, Quebec:—		
Cheese Factory and Creamery Instruction and Inspection		972
BOVING, P. A., Assistant Professor of Agromony, University of British Columbia:—		
*Root Seed Production at Macdonald College		894
BRACKEN, JOHN, B.S.A., Professor of Field Husbandry, Saskatchewan College of Agriculture:—		
Sweet Clover		132
*Sequence of Annual Crops at Saskatoon		152
Lime as a Fertilizer		335
Alfalfa Seed Production and Inoculation		339
*Pasture Crops suitable to Saskatchewan		424
*Potato Selection Work at Saskatoon		907
BRAND, CHARLES J.:—		
The Marketing of Farm Products		183
BREDT, P. F., Acting Secretary, Saskatchewan Live Stock Associations:—		
The Saskatchewan Live Stock Associations		477
BRIGHT, JOHN, Live Stock Commissioner:—		
Encouragement to Breeders		123
Development and Importance of the Cattle Industry		791
BRITTAIN, W. H., B.S.A., Provincial Entomologist, Nova Scotia:—		
Inspection of Nursery Stock, The		1083
BRODRICK, F. W., B.S.A., Professor of Horticulture and Forestry, Manitoba Agricultural College:—		
*Growing Vegetable Seeds		128
*The Hill Selection of Seed Potatoes		810
BROWN, E. A., States Relations Service, Department of Agriculture, Washington:—		
Farm Management Demonstrations in the United States		1008
BROWNE, F. S., B.S.A., Assistant to Dominion Agrostologist:—		
*Experimental Work with Field Root Seed Growing		786
BUNTING, T. G., B.S.A., Professor of Horticulture, Macdonald College:—		
Production of Vegetable Seeds		127
BURRELL, HON. MARTIN, Federal Minister of Agriculture:—		
The Future of the Live Stock Industry		5
C.		
CAESAR, L., B.A., Provincial Entomologist, Ontario:—		
Inspection of Nursery Stock		1084
CAMERON, A. E., Field Officer, Entomological Branch:—		
*Pear Thrips in British Columbia and its Control, The		946
*Illustrated.		

	Page
CAMPBELL, N. A., Ontario Agricultural College:—	
*School for Rural Leadership.....	836
CAMPBELL, MISS FREDERICA, Demonstrator for Women's Clubs, Macdonald College:—	
Short Courses in Household Science.....	318
Home Labour-Saving Devices.....	431
CHRISTAL, R. N., Field Officer for Forest Insects, Entomological Branch:—	
*Forest Insect Investigation in Stanley Park, Vancouver, B.C.....	794
CHURCHILL, F. G., B.S.A., Professor of Soils, Manitoba Agricultural College:—	
*Farm Drainage.....	330
Lime as a Fertilizer.....	335
CLARK, GEO. H., B.S.A., Seed Commissioner:—	
Field Root and Vegetable Seed.....	30
New Control System for Marketing Seed Corn in the Ear.....	226
Subventions Paid to Seed Fairs.....	698
Timothy Seed Shipments.....	864
COCKS, A. W., B.Sc., Director of School Agriculture, Saskatchewan:—	
Elementary Agricultural Instruction—A Review and Forecast.....	70
*School Gardens.....	163
*The Beautification of School Grounds.....	277
School Garden Plans for 1916.....	358
The Consolidation of Rural Schools.....	365
School Fairs for 1916.....	458
Home School Gardens in Southern Saskatchewan.....	646
*Rural School with Ten-Acre Grounds.....	763
Better Schools Day in Saskatchewan.....	839
Training of Teachers for Agricultural Instruction.....	922
Summer Schools for Teachers.....	932
COUSINS, F. C., Principal, Creelman School, Saskatchewan:—	
Creelman, S. D. No. 998.....	1004
COUTURE, DR. J. A., Veterinary Superintendent:—	
*Levis Animals' Quarantine Station, The.....	118
CRAIG, H. A., B.S.A., Deputy Minister of Agriculture, Alberta:—	
Short Course Schools.....	450
Better Farming Train.....	568
Extension Work in Alberta.....	635
CREELMAN, J. M., B.S.A., Assistant, Precooling and Cold Storage Warehouse, Grimsby, Ontario:—	
*Peach Package Tests—Season of 1915.....	222
CRIDDLE, NORMAN, Field Officer, Dominion Entomological Laboratory, Treesbank, Manitoba:—	
*Some Stem Maggots Attacking Growing Grain.....	504
CUMMING, M., B.A., B.S.A., Secretary for Agriculture, Nova Scotia:—	
Crop Production in 1915.....	33
The Value of Farm Production in 1915.....	231
*The Science Building.....	254
Short Courses.....	311
Farm Drainage.....	327
*Agriculture in Nova Scotia.....	414
Grants to Live Stock and Poultry Organizations.....	546
Extension Work.....	622
Seed Fairs.....	716
Farm Mechanics.....	731
Educational Exhibits at Fall Fairs.....	812
*The Agricultural College.....	815
Co-operative Marketing of Wool.....	880
*Motor Car in District Representative Work, The.....	986
Teaching of Household Science, The.....	1014

D.

DAGGETT, J. B., Secretary for Agriculture, New Brunswick:—	
Crop Production in 1915.....	35
The Value of Farm Production in 1915.....	232
Farm Labour.....	245
*Farm Drainage.....	327
*Illustrated.	

Page

Grants to Live Stock and Poultry Organizations.....	547
*Agriculture in New Brunswick.....	609
Seed Selection and Seed Fairs.....	821
Agricultural Legislation.....	1087
DANDENO, J. B., Inspector of Elementary Agricultural Classes for Ontario:—	
School Gardens.....	160
The Beautification of School Grounds.....	274
School Garden Plans for 1916.....	357
Summer Schools for Teachers.....	570, 929
Training of Teachers for Agricultural Instruction.....	920
Agricultural High Schools.....	1002
DAY, WM. H., B.A., Professor of Physics, Ontario Agricultural College:—	
The Teaching of Science.....	470
Sewage Disposal in Rural Districts.....	840
DAY, GEO. E., B.S.A., Professor of Animal Husbandry, Ontario Agricultural College:—	
The Ventilation of Live Stock Buildings.....	618
DAWSON, T., M.D., Medical Superintendent, Alberta:—	
The Industrial Farm System of Alberta.....	344
DEAN, H. H., B.S.A., Professor of Dairying, Ontario Agricultural College:—	
*The Dairy School, Ontario Agricultural College.....	47
DELURY, ABBIE, MISS, Director of Homemakers' Clubs, Regina, Saskatchewan:—	
Home Labour-Saving Devices.....	432
*The Model Kitchen.....	752
DE WOLFE, L. A., Director Rural Science Schools, Nova Scotia:—	
*Elementary Agricultural Instruction—A Review and Forecast.....	63
*School Fairs.....	77
*School Gardens.....	158
School Garden Plans for 1916.....	356
School Fairs for 1916.....	454
Summer Schools for Teachers.....	569
Home School Gardens.....	639
Rural Science Summer School.....	838
DIGGES, D. D., Superintendent of the Tobacco Station, Harrow, Ontario:—	
Experiments Being Conducted at The Harrow Tobacco Station.....	684
DOHERTY, T. K., LL.B., Commissioner for Canada of the International Institute of Agriculture:—	
The International Institute of Agriculture and the War.....	27
DOMAILLE, THOMAS, Acting Weed and Seed Commissioner, Saskatchewan:—	
Weed Control.....	250
DUFAULT, S., Deputy Minister of Mines and Colonization, Quebec:—	
Farm Labour.....	245
DYMOND, JOHN R., Seed Analyst, Seed Branch, Ottawa:—	
Seed Testing 1915-16.....	403
E.	
ELFORD, F. C., Dominion Poultry Husbandman:—	
*The Ventilation of Poultry Houses.....	681
EMBERLEY, G. E., Lecturer in Agricultural Engineering, Macdonald College:—	
Farm Drainage.....	329
ENGLISH, H. O., B.S.A., Chief Soil and Crop Instructor, British Columbia:—	
Seed Fairs.....	726
Field Root Seed Production.....	808
The Hill Selection of Seed Potatoes.....	811
EVANS, JOHN, Professor of Manual Training, Ontario Agricultural College:—	
*Farm Mechanics.....	732
F.	
FERGUSON, ETHEL H., Teacher, South Weyburn School, Saskatchewan:—	
*School Gardens.....	167
FINDLAY, WILLIAM, President of the Horticultural Society, Carleton Place, Ont.:—	
A Blue Bird Bazaar.....	374
FLETCHER, ROBERT, B.A., Deputy Minister of Education, Manitoba:—	
Training of Teachers for Agricultural Instruction, The.....	921
FULLER, F. L., Superintendent Agricultural Societies, Nova Scotia:—	
Boys' Turnip Growing Competition.....	346
*Illustrated.	

G.

GAREAU, A. L., Director of Short Courses, Quebec:—	
*Short Courses—The First Series.....	313
GIBSON, ARTHUR, Chief Assistant Entomologist, Ottawa:—	
Fumigation and Inspection of Imported Nursery Stock, The.....	1052
GIBSON, J. W., M.A., Director of Elementary Agricultural Education, British Columbia:—	
*Elementary Agricultural Instruction—A Review and Forecast.....	74
School Fairs.....	88
The Beautification of School Grounds.....	278
School Garden Plans for 1916.....	359
Training of Teachers for Agricultural Instruction.....	923
Agriculture in High Schools.....	1105
GOODWIN, W. L., D. Sc., Dean of Queen's University, Kingston, Ontario:—	
The Teaching of Science.....	469
GREENWAY, S. E., Director Extension Department, College of Agriculture, Saskatchewan:—	
*Short Courses.....	322
Seed Fairs.....	724
Educational Exhibits at Fall Fairs.....	813
GREIG, A. R., B.Sc., Professor of Agricultural Engineering, College of Agriculture, Saskatchewan:—	
Farm Mechanics.....	737
Sewage Disposal in Rural Districts.....	841
GRENIER, J. ANTONIO, Deputy Minister of Agriculture, Quebec:—	
Farm Drainage.....	329
Grants to Live Stock and Poultry Organizations.....	548
*The Maple Sugar and Syrup Industry.....	742
GRINDLEY, F. H., B.S.A., Assistant to the Fruit Commissioner, Ottawa:—	
Export Apple Trade.....	308
Apple Production in 1915 and Inspection Statistics.....	516
Apple Situation in Eastern Canada, The.....	954
Great Britain's Embargo on Fruit.....	603
*Sale of Canadian Apples in Great Britain, The.....	1052
GRIFFITH, J. E., Deputy Minister and Public Works Engineer, British Columbia:—	
Rural Highways.....	747
GRISDALE, J. H., B.Agr., Director, Dominion Experimental Farms:—	
Exhibit at the Central Canada Exhibition.....	860
GÜSSOW, H. T., Dominion Botanist:—	
Scarcity of Seed Potatoes.....	210
Plant Diseases vs. National Wealth.....	211
The Grain Rust in the Prairie Provinces.....	861

H.

HARCOURT, R., B.S.A., Professor of Chemistry, Ontario Agricultural College:—	
Lime as a Fertilizer.....	334
The Teaching of Science.....	470
HARRISON, F. C., D.Sc., F.R.S.C., Principal, Macdonald College:—	
Short Courses.....	317
HARRISON, PROF. T. J., B.S.A., Professor of Field Husbandry, Manitoba Agricultural College:—	
Production of Field Root Seed.....	129
Alfalfa Seed Production and Inoculation.....	338
*Pasture Crops Suitable to Manitoba.....	419
*The Feeding Value of Straw.....	781
HARE, J. H., B.S.A., Poultry Division, Live Stock Branch, Ottawa:—	
The Egg Situation in Canada.....	867
HERNER, M. C., B.S.A., Professor of Poultry Husbandry, Manitoba Agricultural College:—	
Ventilation of Poultry Houses, The.....	712
Co-Operative Fattening of Farm Chickens.....	823
Poultry Market Situation, The.....	998
HEWITT, C. GORDON, D.Sc., Dominion Entomologist:—	
The Introduction and Establishment in Canada of The Natural Enemies of The Brown-Tail and Gipsy Moths.....	20
Outline of Work Projected for 1916.....	400
The Protection of Migratory Birds in Canada.....	1032

*Illustrated.

HILL, A. E., Miss, Macdonald College, Quebec:—	
*The Model Kitchen.....	748
HODGETTS, P. W., B.S.A., Director Fruit Branch, Department of Agriculture:—	
Advertising Canadian Fruit.....	729
HOPKINS, S. H., B.S.A., Assistant Live Stock Commissioner, British Columbia:—	
*Cheese Factory and Creamery Instruction and Inspection.....	984
HOTCHKISS, CHARLES S., Chief Publicity Commissioner for Alberta:—	
*Crop Production in 1915.....	40
Farm Labour.....	247
HOWITT, J. E., M.S.A., Professor of Botany, Ontario Agricultural College:—	
Weed Control.....	249
HUTTON, G. H., B.S.A., Superintendent, Experimental Station, Lacombe, Alta:—	
The Feeding Value of Straw.....	783

J.

JAMES, C. C., C.M.G., LL.D., M.A., late Commissioner of Agriculture:—	
1915 and 1916.....	109
JOHNSON, DONALD, Fruit Commissioner:—	
The Fruit Crop of 1915.....	26
Fruit Prospects in Canada.....	790
JULL, M. A., B.S.A., Manager and Lecturer Poultry Department, Macdonald College:—	
Ventilation of Poultry Houses—A House for Fifty Hens as Basis of Consideration, The.....	709

K.

KENNEDY, A., M.A., Inspector of Schools, Weyburn Inspectorate, Saskatchewan:—	
Short Course at Weyburn.....	323
KING, J. K., B.S.A., Macdonald College Demonstrator, Pontiac County, Que.:—	
The Selection and Equipment of District Representatives' Offices.....	241
KLINCK, L. S., B.S.A., Dean of the College of Agriculture, British Columbia:—	
Notes on The University Agricultural Work.....	831

L.

LA CROIX, BROTHER JEAN DELA, Director, Oka Agricultural Institute, La Trappe:—	
The Annex to the Oka Agricultural Institute.....	893
LELACHEUR, G., B.S.A., Seed Branch, Ottawa:—	
Seed Potatoes for 1917.....	1057
LIGOURI, BROTHER, Lecturer on Poultry, Oka Agricultural Institute, La Trappe:—	
Teaching Poultry Breeding.....	139
LODS, EMILE A., B.S.A., Macdonald College Demonstrator:—	
School Fairs in the District of Bedford, Que.....	141

M.

MACOUN, W. T., Dominion Horticulturist:—	
*Experiments in Growing Vegetable Seeds in 1915.....	11
*Seed Potatoes.....	303
*Horticulture at The Dominion Experimental Station, Morden, Manitoba.....	502
Vacant Lot Gardens in Ottawa.....	574
The Improvement of Potatoes by Hill Selection.....	784
*Canadian Maples to Mark Canadian Graves in France.....	1038
MAGNAN, JEAN-CHARLES, B.S.A., District Agriculturist, St. Casimir, Quebec:—	
School Gardens.....	159
*The Beautification of School Grounds.....	272
School Fairs for 1916.....	454
Home School Gardens.....	641
Agricultural School Museums.....	886
School Gardens' Association of America, The.....	1088
MACKAY, A. H., B.A., LL.D., Superintendent of Education, Nova Scotia:—	
Beautification of School Grounds, The.....	270
Training of Teachers for Agricultural Instruction, The.....	917
Teaching of Household Science, The.....	1093
MACKAY, CHAS. J., Principal, Souris School, Weyburn, Saskatchewan:—	
*School Gardens.....	168
*Illustrated.	

	Page
MAC KAY, W. A., Dairy Superintendent, Department of Agriculture, Nova Scotia:—	
Cheese Factory and Creamery Instruction and Inspection	966
Creameries Booth at the Provincial Exhibition, Halifax	993
MACKENZIE, D. S., Deputy Minister, Department of Education, Alberta:—	
Training of Teachers for Agricultural Instruction, The	922
MALTE, M. O., Ph.D., Dominion Agrostologist:—	
Inoculation of Alfalfa, The	213
MARSAN, I. J. A., Professor of Agriculture, Oka Agricultural Institute, La Trappe:—	
Sweet Clover	130
MCCAIG, J., Editor of Publications, Alberta Department of Agriculture:—	
Grants to Live Stock and Poultry Organizations	550
Agricultural Legislation	558
Seed Fairs	725
Farm Mechanics	738
Educational Exhibits at Fall Fairs	814
Cheese Factory and Creamery Instruction and Inspection	983
*Agriculture in Alberta	1061
Teaching of Household Science	1102
MCCREADY, PROFESSOR S. B., B.S.A., formerly Director, Rural Science Department, Prince of Wales College, Charlottetown, P.E.I.:—	
Summer School for Teachers	925
MCDUGALL, C. W., Dairy Superintendent, New Brunswick Department of Agriculture:—	
Cheese Factory and Creamery Instruction and Inspection	971
MCKILLICAN, W. C., B.S.A., Superintendent, Experimental Farm, Brandon, Manitoba:—	
The Feeding Value of Straw	781
MCLAIN, J. D., Assistant Deputy Minister and Secretary, Department of Indian Affairs, Ottawa:—	
Good Farming and Gardening Competitions for Indians	373
MCLAIN, LEONARD, S., M.Sc., Field Officer, Entomological Laboratory, Fredericton, New Brunswick:—	
*Rearing the Parasites of the Brown-Tail Moth in New England for Colonization in Canada	22
MCMILLAN, L. B., Secretary of Public Works, Prince Edward Island:—	
Rural Highways	525
MCMILLAN, A. J., B.S.A., formerly Deputy Minister of Agriculture for Manitoba:—	
Crop Production in 1915	37
The Value of Farm Production in 1915	234
MCOUAT, J. EGBERT, Demonstrator to Rural Schools, Rural School Department, Macdonald College:—	
Elementary Agricultural Instruction—A Review and Forecast	67
The Beautification of School Grounds	273
MCPHERSON, REV. HUGH, District Representative, Antigonish, Nova Scotia:—	
*The Selection and Equipment of District Representatives' Offices	236
MILLER, J. C., B.Sc., Ph.D., Provincial Director of Technical Education, Alberta:—	
*Elementary Agricultural Instruction—A Review and Forecast	73
*School Fairs	87
*School Gardens	169
Teaching of Household Science, The	1102
MILLS, R. W., B.S.A., In Charge of Agricultural Section, Meteorological Office, Toronto, Ontario:—	
Agricultural Meteorology in Canada	177
MITCHELL, J. W., Dairy Commissioner, Manitoba Department of Agriculture:—	
Cheese Factory and Creamery Instruction and Inspection	980
MOE, G. G., B.S.A., Assistant to the Dominion Cerealists:—	
The New Cereal and Agrostology Building	110
MOORE, W. W., Chief, Inspection and Markets Division, Dairy and Cold Storage Branch:—	
Transportation of Dairy Products	953
MOLLOY, THOMAS M., Secretary, Bureau of Labour, Saskatchewan:—	
Farm Labour	246
MUNRO, WM. A., B.A., B.S.A., Superintendent, Experimental Farm, Rosthern, Saskatchewan:—	
The Feeding Value of Straw	782

*Illustrated.

INDEX TO VOLUME III

1135

Page

MURRAY, JAS., B.S.A., Professor of Field Husbandry, Macdonald College:—	
Alfalfa Seed Production and Inoculation.....	336
Exhibit at Sherbrooke Fair.....	995
MURRAY, WALTER C., M.A., LL.D., President University of Saskatchewan:—	
Teaching of Household Science, The.....	1102
MURCHIE, R. W., Lecturer in Rural Sociology at the Manitoba Agricultural College:—	
Short Course for Rural Ministers.....	837

N.

NAGANT, H., Editor Le Journal d'Agriculture, Quebec, Que.:—	
The Progress of Agriculture.....	138
The Value of Farm Production in 1915.....	233
*The Selection and Equipment of District Representatives' Offices.....	238
The Sixth Provincial Seed Grain Exhibition.....	259
*Agriculture in Quebec.....	518
The Industrial Farm System of Quebec.....	623
*Seed Fairs.....	718
The Teaching of Agriculture at Fairs and Exhibitions.....	890
NEWMAN, L. H., B.S.A., Secretary, Canadian Seed Growers' Association, Ottawa:—	
Seed Fairs.....	729
Field Root Seed Production.....	842
The Hill Selection of Seed Potatoes.....	842
NEWTON, S. T., B.S.A., Superintendent of Agricultural Societies, Manitoba:—	
School Fairs for 1916.....	457
Seed Grain Fairs.....	825

P.

PASQUET, PROFESSOR, Professor of Animal Husbandry, School of Agriculture, Ste. Anne de la Pocatière, Quebec:—	
*The Dairy Herd at Ste. Anne de la Pocatière.....	56
PELLETIER, REV. NÔEL, Director, School of Agriculture, Ste. Anne de la Pocatière, Quebec:—	
*Short Courses—The Second Series.....	315
PETCH, C. E., B.S.A., Field Officer, Dominion Entomological Laboratory, Hemmingford, Quebec:—	
Controlling Apple Insects in the Province of Quebec.....	697
PETTIT, MORLEY, Provincial Apiarist, Ontario Agricultural College:—	
Sweet Clover as a Honey Plant.....	132
Spring Report on Bee-Keeping.....	565
PUTNAM, GEO. A., B.S.A., Superintendent of Institutes for Ontario:—	
Demonstration-Lecture Courses for Women's Institutes.....	264
Live Stock Short Courses, 1915-16.....	442
Cheese Factory and Creamery Instruction and Inspection.....	976

R.

RAVENHILL, ALICE, F. R. San. I., Member, Advisory Board, Women's Institutes of British Columbia:—	
*The Model Kitchen.....	757
REEK, W. R., B.S.A., Director of Agricultural Instruction, Prince Edward Island:—	
Elementary Agricultural Instruction—A Review and Forecast.....	60
Short Courses.....	310
Farm Drainage.....	325
*Rural Life Conferences.....	834
Co-Operative Marketing of Wool.....	880
Training of Teachers for Agricultural Instruction, The.....	916
*Agriculture in Prince Edward Island.....	958
*Cheese Factory and Creamery Instruction and Inspection.....	964
REYNOLDS, J. B., M.A., President, Manitoba Agricultural College:—	
Sewage Disposal in Rural Districts.....	841
Teaching of Household Science, The.....	1099
RIVERS, J. H., M.D., Warden, Alberta:—	
The Provincial Gaol.....	345
*Illustrated.	

RHOADES, ERNEST, B.S.A., Live Stock Branch, Ottawa:— An Illustration of Successful Co-Operation in the Marketing of Eggs and Poultry	124
ROADHOUSE, W. BERT., Deputy Minister of Agriculture, Ontario:— Crop Production in 1915.....	85
Farm Labour.....	246
*The New Physics Building, O.A.C., Guelph.....	261
Grants to Live Stock and Poultry Organizations.....	548
*Agriculture in Ontario.....	799
An Agricultural School for Eastern Ontario.....	899
Encouragement to Sheep Raising.....	998
ROBINSON, K. B., Fruit Branch, Ottawa:— Notes Regarding Season 1915-16.....	228
ROSS, THEODORE, B.A., B.S.A., formerly Secretary for Agriculture, Prince Edward Island:— Crop Production in 1915.....	33
The Production of Vegetable Seeds.....	126
The Value of Farm Production in 1915.....	231
The Selection and Equipment of District Representatives' Offices..	236
Grants to Live Stock and Poultry Organizations...	546
Seed Fairs.....	714
Field Root Seed Production.....	807
Motor Car in District Representative Work, The.....	986
RUTHERFORD, W. J., B.S.A., Dean, College of Agriculture, Saskatoon, Sask.:— Ventilation of Live Stock Buildings, The.....	619
S.	
SADLER, WILFRID, B.S.A., N D.D., Bacteriology Department, Macdonald College:— Bacterized Peat or Humogen	43
SANDERS, G. E., Field Officer in Charge Dominion Entomological Laboratory, Annapolis Royal, N.S.:— Arsenate of Lime in Combination with Soluble Sulphur as a Spray Material for the Apple	305
SAVOIE, F. N., Department of Agriculture, Quebec:— Production of Root Seed.....	892
Motor Car in District Representative Work, The.....	988
SCOTT, WM. E., Deputy Minister of Agriculture, British Columbia:— Weed Control	253
A Publications Branch Formed.....	451
Inspection of Fruit Pests.....	452
*Agriculture in British Columbia.....	1071
SHAW, A. M., B.S.A., Professor of Animal Husbandry, College of Agriculture, Saskatchewan:— *The Better Farming Train.....	909
SHAW, H. H., Acting Superintendent of Education, Prince Edward Island:— The Beautification of School Grounds.....	270
Home School Gardens.....	638
SHUTT, FRANK T., M.A., D.Sc., Dominion Chemist:— Ottawa:— Bacterized Peat or Humogen.....	10
SLADEN, F. W. L., Dominion Apiarist:— Results from Bees at the Dominion Experimental Farms in 1915	594
*Recent Work of the Bee Division.....	1041
SMITH, EDWIN, B.Sc., in charge of Precooling and Cold Storage Warehouse, Grimsby, Ontario:— *The Maturity of Fruits for Precooled Shipments.....	18
*Peach Precooling.....	121
*Precooling Raspberries.....	865
SMITH, MRS. H. W., Wife of Professor H. W. Smith, of the College of Agriculture, Truro, Nova Scotia:— The Agricultural College Library and Its Opportunity.....	766
SMITH, JAS. D., Superintendent Seed and Weed Branch, Edmonton, Alberta:— Weed Control.....	251
SMITH, L. J., B.Sc., Professor of Agricultural Engineering, Manitoba Agricultural College:— Farm Mechanics.....	734
*Illustrated.	

	Page
SNELL, J. F., D.Sc., Professor of Chemistry, Macdonald College:—	
Teaching of Science, The.....	468
SOUTHWORTH, WILLIAM, M. Agr., F.L.S., Agrostologist, Manitoba Agricultural College:—	
Alfalfa Hybridization.....	445
SPRY, J. R., B.S.A., in charge of Drainage Work, Ontario Agricultural College:—	
*Drainage Work for 1916.....	441
STEPHEN, W. J., B.A., Principal, School of Agriculture, Claresholm, Alberta:—	
Sweet Clover.....	135
STEEVES, R. P., M.A., Director, Elementary Agricultural Education, New Brunswick:—	
Elementary Agricultural Instruction—A Review and Forecast.....	65
School Fairs.....	281
The Teachers' Winter Short Course.....	282
Summer Schools for Teachers.....	569
Home School Gardens.....	640
The Training of Teachers for Agricultural Instruction.....	919
Summer Schools for Teachers.....	927
STERNS, HAZEL, MISS, Supervisor of Women's Institutes, Prince Edward Island:—	
The Household Science Short Courses.....	572
STRICKLAND, E. H., Field Officer in charge of Entomological Laboratory, Lethbridge, Alberta:—	
*The March Fly (<i>Bibio abbreviatus</i>) in Grain Fields and as a Pest of Celery, STUPART, SIR ROBERT F., Director of Meteorological Service for Canada, Toronto, Ont.:—	600
The Unusual Rainfall.....	765
SWAINE, J. M., Assistant Entomologist in Charge of Forest Insect Investigations:—	
*Injurious Shade Tree Insects of the Canadian Prairies.....	215

T.

TODD, S. E., B.S.A., Director of Industrial Farms, Ontario:—	
*Industrial Farm System, The.....	341
TORRANCE, DR. F., B.A., D.V.S., Veterinary Director General:—	
Notes.....	309
Successful Control of Bovine Tuberculosis.....	309
Foot and Mouth Disease.....	407
Tuberculosis.....	407
Mange Area.....	407
Hog Cholera.....	407
TOTHILL, J. D., B.S.A., Field Officer, Dominion Entomological Laboratory, Fredericton, New Brunswick:—	
*Introduction and Establishment in Canada of the Natural Enemies of the Brown-tail and Gipsy Moths, The.....	111
TREHERNE, R. C., B.S.A., Field Officer, Entomological Branch:—	
*Pear Thrips in British Columbia and its Control, The.....	946
TRUDEL, AUG., Manager, Cheesemakers' Co-operative Agricultural Association, Quebec:—	
Grading of Agricultural Products, The.....	348
TRUEMAN, JOHN M., B.S.A., Professor of Agriculture, Agricultural College, Nova Scotia:—	
Sweet Clover.....	130
The Growing of Turnip Seed.....	256
Lime as a Fertilizer.....	333
*Ventilation of Live Stock Buildings—The King System of Ventilation.....	615
Field Root Seed Production.....	807
TWEDDLE, A. B., Assistant Statistician, British Columbia:—	
Crop Production in 1915.....	42
TWISS, MISS F. A., Director, Household Science, Saskatchewan:—	
Teaching of Household Science, The.....	1100

V.

VARLEY, WM. B., Assistant to the Commissioner of Agriculture, Ottawa:—	
Agricultural Development of Japan, The.....	1013
*Illustrated.	

W.	Page
WATSON, MISS MARY M., Director Household Science Department, Macdonald Institute, Guelph:—	
Teaching of Household Science, The.....	1097
WATSON, H. W., M.A., Director of Elementary Agriculture, Department of Education, Manitoba:—	
*Elementary Agricultural Instruction—A Review and Forecast.....	68
School Fairs.....	84
*School Gardens.....	161
*The Beautification of School Grounds.....	275
*School Garden Plans for 1916.....	357
Consolidation of Rural Schools, The.....	362
Home School Gardens.....	644
Agricultural High Schools.....	1003
WHITLEY, CHAS. F., in Charge of Dairy Records, Dairy and Cold Storage Branch:—	
Outlook for Cow-Testing, The.....	406
WIANCKO, T. A. F., Provincial Dairy Instructor, British Columbia:—	
Cow-Testing Work.....	913
WILFRID, BRO., Poultry Manager, Oka Agricultural Institute, La Trappe:—	
Ventilation of Poultry Houses, The.....	710
WILSON, TOM, Inspector of Indian Orchards, Entomological Branch:—	
*Control of Insect Pests in the Orchards on the Indian Reserves in British Columbia, The.....	856
WILSON, J. LOCKIE, Superintendent of Agricultural and Horticultural Societies, Ontario:—	
Seed Fairs.....	720
WINSLOW, R. M., B.S.A., Provincial Horticulturist and Inspector of Fruit Pests, British Columbia:—	
Advertising Canadian Fruit.....	730
WINTER, HAZEL E., Supervisor of Women's Institutes, New Brunswick:—	
Home Labour-Saving Devices.....	431
Y.	
YATES, S. W., Saskatchewan Grain Growers' Association, Moose Jaw, Saskatchewan:—	
Patriotic Acre Scheme, The.....	267
YORSTON, W. G., C.E., Assistant Road Commissioner, Nova Scotia:—	
*Rural Highways.....	526
Z.	
ZAVITZ, C. A., B.S.A., Professor of Field Husbandry, Agricultural College:—	
Sweet Clover.....	130
ZUFELT, L. A., Superintendent, Eastern Dairy School, Kingston, Ontario:—	
*Eastern Dairy School, Kingston, Ontario, The.....	50
*Illustrated.	

INDEX TO SOURCE

PART I.

THE DOMINION DEPARTMENT OF AGRICULTURE.

Agricultural Instruction Act, The.....	776
Accomplishments under The Agricultural Instruction Act.....	592
Agricultural Instruction Act and the Rural School, The.....	775
Agricultural War Book.....	397
Agricultural Legislation in 1916.....	1031
Black, W. J., The Appointment of.....	680
Conservation of Breeding Cows, The.....	206
Federal Appropriations for Agriculture.....	501
Flax Industry, The.....	302
Home School Gardens.....	589
Honour Roll.....	1058

	Page
Instruction in Dairying, The Value of.....	943
James, C. C., The late	590
Live Stock Industry, The Future of the.....	5
Potato Trade with the United States re-established.....	6
Potato Export Trade	1036
Production and Thrift.....	301, 494
Protection of Migratory Birds in Canada, The	1032
Rural Highways.....	493
Seed Fairs and Crop Improvement, The	679
Training for Agricultural Instruction	855

THE DOMINION EXPERIMENTAL FARMS

THE DIVISION OF ANIMAL HUSBANDRY:—

Cattalo Herd Established, A.	208
Concentrated Protein Meals for Dairy Cattle, Sheep and Swine, Comparative Value of	687
Ventilation of Live Stock Buildings, The.....	598

THE DIVISION OF APICULTURE: —

Results from Bees at the Dominion Experimental Farms in 1915.....	594
Recent Work of the Bee Division	1041

THE DIVISION OF BOTANY:—

Grain Rust in the Prairie Provinces, The	861
Plant Diseases vs. National Wealth	211
Seed Potatoes, Scarcity of	210

THE DIVISION OF CEREAL HUSBANDRY:—

New Cereal and Agrostology Building, The	110
--	-----

THE DIVISION OF CHEMISTRY:—

Bacterized Peat or Humogen.....	10
---------------------------------	----

THE DIVISION OF FORAGE PLANTS:—

Field Root Seed Growing, Experimental Work with	786
Inoculation of Alfalfa, The.....	213

THE DIVISION OF HORTICULTURE:—

Canadian Maples to Mark Canadian Graves in France	1038
Experiments in Growing Vegetable Seeds in 1915.....	11
Horticulture at the Dominion Experimental Station, Morden, Manitoba.....	502
Improvement of Potatoes, by Hill Selection, The	784
Seed Potatoes	303

THE POULTRY DIVISION:—

Farmer's Poultry House, The.....	682
Ventilation of Poultry Houses, The.....	681

THE TOBACCO DIVISION:—

Changes in Staff	504
Experiments being Conducted at the Harrow Tobacco Station.....	684
Studies of Tobacco Soils in Canada.....	595

THE DAIRY AND COLD STORAGE BRANCH:—

Conference of Dairy Recorders.....	221
Cow-Testing, Associations, Spread of.	221
The Outlook for.	406
Growth in.....	790
Dairying in Prince Edward Island and Nova Scotia	693
Grading Creamery Butter in the Prairie Provinces.....	511
Increase in the Imports of Butter.....	789

	Page
Inspection of Dairy Products.....	510
Maturity of Fruits for Precooled Shipments.....	18
Peach Package Tests,—Season of 1915.....	222
Peach Precooling.....	121
Pepsin as a Substitute for Rennet in Cheese Making.....	789
Precooling Raspberries.....	865
Refrigerator Car Services, Special.....	508
Rennet Extract, High Cost of.....	221
Substitutes for Rennet in Cheese Making.....	607
Transportation of Dairy Products.....	953
THE ENTOMOLOGICAL BRANCH:—	
Apple Insects in the Province of Quebec, Controlling.....	697
Appointment of Field Officer.....	307
Arsenate of Lime in Combination with Soluble Sulphur as a Spray Material for the Apple.....	305, 403
Control of Insects Pests in the Orchards on the Indian Reserves in British Columbia.....	856
Cunningham, Thomas H.....	308
Destructive Insect and Pest Act, The.....	952
Forest Insect Investigation in Stanley Park, Vancouver, B.C.....	794
Fumigation and Inspection of Imported Nursery Stock under Federal Legislation, The.....	1046
Injurious Shade Tree Insects of the Canadian Prairies.....	215
Insect Pests in the Orchards in the Indian Reserves in British Columbia.....	856
Introduction and Establishment in Canada of the Natural Enemies of the Brown-tail and Gipsy Moths, The.....	20, 111
March Fly (<i>Bibio abbreviatus</i>) in Grain Fields and as a pest of Celery.....	600
Notes.....	116, 577
Outline of Work Projected for 1916.....	400
Pear Thrips in British Columbia and its Control, The.....	946
Rearing the Parasites of the Brown-tail Moth in New England for Colonization in Canada.....	22
Stem Maggots Attacking Growing Grain, Some.....	504
THE EXHIBITION BRANCH:—	
Canada at San Diego.....	208
THE FRUIT BRANCH:—	
Apple Production in Ontario in 1915.....	516
Apple Situation in Eastern Canada, The.....	954
Export Apple Trade.....	308
Fruit Crop of 1915, The.....	26
Meetings.....	412
Prospects in Canada.....	413, 790
Great Britain's Embargo on Fruit.....	603
Inspection of Small Fruits.....	413
Inspection Statistics.....	517
Instruction in Apple Packing.....	309
Notes Regarding Season 1915-16.....	228
Sale of Canadian Apples in Great Britain, The.....	1052
THE HEALTH OF ANIMALS BRANCH:—	
American Bacon Cured in Canada.....	408
Animal Contagious Diseases Act Amended, The.....	32, 230, 409
Foot and Mouth Disease, Imports of Animals, Etc., Orders Respecting.....	117, 515
Importations from Illinois.....	696
Levis Animals' Quarantine Station, The.....	118
Notes.....	309, 407
Sex of Cattle Slaughtered, The.....	230
THE INTERNATIONAL INSTITUTE BRANCH:—	
International Institute of Agriculture and the War, The.....	27
THE LIVE STOCK BRANCH:—	
Cattle Industry, Development and Importance of, The.....	791
Conservation of Breeding and Feeding Cattle in the Western Provinces.....	955
Egg Exhibit at Calgary.....	695

	Page
Situation, The.....	867
Encouragement to Live Stock Breeders.....	123
Loan of Rams and Boars to Farmers' Associations, Statement with respect to the	409
Marketing Problem, The.....	28
Record of Performance, The.....	513
Successful Co-operation in the Marketing of Eggs and Poultry, An illustration of	124
Thoroughbred Stallion from the Royal Stud, A.....	410
Wool Exhibit, The.....	512, 1056
Wool Grading Operations, 1916, Preliminary Report of.....	868
Wool for Market, Assistance to Wool Growers' Associations in Grading and Classifying.....	411
Wool in the Fleece at Canadian Fairs, Prizes for.....	1058

THE SEED BRANCH:—

Field Root and Vegetable Seed.....	30
Grading of Seed Grain, The.....	957
New Control System for Marketing Seed Corn in the Ear.....	226
Paper Packet Seed Investigation.....	604
Seed Testing 1915-16.....	403
Seed Potatoes for 1917.....	1057
Subventions Paid to Seed Fairs.....	698
Timothy Seed Shipments.....	864

MISCELLANEOUS:—

Exhibit at the Central Canada Exhibition.....	860
Farmers' Field Days and Excursions.....	944
Feeding Value of Straw, The.....	781

PART II.

THE PROVINCIAL DEPARTMENTS OF AGRICULTURE AND EDUCATION.

PRINCE EDWARD ISLAND.

Agriculture in Prince Edward Island.....	958
Agricultural Legislation.....	551
Beautification of School Grounds, The.....	270
Cheese Factory and Creamery Instruction and Inspection....	964
Co-operative Marketing of Wool.....	880
Crop Production in 1915.....	33
Elementary Agricultural Instruction—A Review and Forecast.....	60
Farm Drainage.....	325
Field Root Seed Production.....	807
Grants to Live Stock and Poultry Organizations.....	546
Home School Gardens.....	638
Household Science Short Courses, The.....	572
Motor Car in District Representative Work, The.....	986
Rural Highways.....	525
Rural Life Conferences.....	834
School Garden Plans for 1916.....	355
Seed Fairs.....	714
Selection and Equipment of District Representatives' Offices, The..	236
Short Courses.....	310
Summer Schools for Teachers.....	569, 925
Training of Teachers for Agricultural Instruction, The.....	916
Value of Farm Production in 1915, The.....	231
Vegetable Seeds, The Production of....	126

NOVA SCOTIA.

Agriculture in Nova Scotia.....	414
Agricultural College Library and its Opportunity.....	766
Agricultural Legislation.....	551
Beautification of School Grounds, The.....	270
Boys' Turnip Growing Competition.....	346
Cheese Factory and Creamery Instruction and Inspection....	966
Co-operative Marketing of Wool.....	881
Creameries Booth at the Provincial Exhibition, Halifax.....	993
Crop Production in 1915.....	33

	Page
Educational Exhibits at Fall Fairs.....	812
Elementary Agricultural Instruction—A Review and Forecast.....	63
Extension Work.....	622
Farm Drainage.....	327
Farm Mechanics.....	731
Field Root Seed Production.....	807
Grants to Live Stock and Poultry Organizations.....	546
Home School Gardens.....	639
Industrial Farm System, The.....	434
Inspection of Nursery Stock, The.....	1083
Lime as a Fertilizer.....	333
Nova Scotia Agricultural College, The.....	815
Motor Car in District Representative Work, The.....	986
Rural Highways.....	526
Rural Science Summer School.....	838
School Fairs.....	77
For 1916.....	454
School Gardens.....	158
School Garden Plans for 1916.....	356
Science Building at College of Agriculture, Opening of the new.....	136
Science Building, The.....	254
Seed Fairs.....	716
Selection and Equipment of District Representatives' Offices, The.....	236, 238
Short Courses.....	311
Summer Schools for Teachers.....	569
Sweet Clover.....	130
Teaching of Household Science, The.....	1093
Training of Teachers for Agricultural Instruction, The.....	917
Turnip Seed, The Growing of.....	256
Value of Farm Production in 1915, The.....	231
Ventilation of Live Stock Buildings.....	615

NEW BRUNSWICK.

Agricultural Legislation.....	1087
Cheese Factory and Creamery Instruction and Inspection.....	971
Competitions for Boys and Girls.....	257
Consolidation of Rural Schools.....	362
Crop Production in 1915.....	35
Elementary Agricultural Instruction—A Review and Forecast.....	65
Farm Drainage.....	327
Farm Labour.....	245
Grants to Live Stock and Poultry Organizations.....	547
Home Labour-Saving Devices.....	431
Home School Gardens.....	640
Notes.....	1088
Rural Highways.....	529
School Fairs.....	281
Seed Selection and Seed Fairs.....	821
Summer Schools for Teachers.....	569, 927
Teachers' Winter Short Course, The.....	282
Training of Teachers for Agricultural Instruction, The.....	919
Value of Farm Production in 1915, The.....	232
Women's Institutes, Fourth Annual Convention of.....	1104

QUEBEC.

Agriculture in Quebec.....	518
Agricultural Legislation.....	435
Agricultural School Museums.....	886
Annex to the Oka Agricultural Institute, The.....	893
Apple Box Competition at the Oka Agricultural Institute.....	55
Bacon Hog Contest.....	563
Bacon Industry, The.....	887
Beautification of School Grounds, The.....	272
Cheese Factory and Creamery Instruction and Inspection.....	972
Co-operative Marketing of Wool.....	881

	Page
Dairy Herd at Ste. Anne de la Pocatière, The.....	56
Dairy Inspectors in Convention.....	563
Dairy Statistics for 1915.....	627
District Representatives, Notes From.....	349, 560, 740
Examinations at the Oka Agricultural Institute.....	745
Farmers' Agricultural Union, Quebec.....	258
Farm Drainage.....	329
Farm Labour.....	245
Grading of Agricultural Products, The.....	348
Graduates of the School of Agriculture, Ste. Anne de la Pocatière.....	745
Grants to Live Stock and Poultry Organizations.....	548
Home School Gardens.....	641
Industrial Farm System, The.....	623
Maple Sugar Industry, The.....	261, 742
Motor Car in District Representative Work, The.....	988
Poultry Association for the Province of Quebec, A.....	260
Production of Root Seed, The.....	892
Progress of Agriculture, The.....	138
Provincial Seed Grain Exhibition, The Sixth.....	259
Rural Highways.....	530
School Fairs.....	79
For 1916.....	454
School Gardens.....	159
Association of America.....	1088
Seed Fairs.....	718
Selection and Equipment of District Representatives' Offices, The.....	238
Short Courses in Agriculture.....	260, 313, 315
Sweet Clover.....	130
Teaching of Agriculture at Fairs and Exhibitions, The.....	890
Teaching Poultry Breeding.....	139
Value of Farm Production, The.....	233
Ventilation of Live Stock Buildings, The.....	618
 MACDONALD COLLEGE:—	
Alfalfa Seed Production and Inoculation.....	336
Bacterized Peat or Humogen.....	436
Beautification of School Grounds, The.....	273
Elementary Agricultural Instruction.....	67
Exhibit at Sherbrooke Fair.....	995
Farm Drainage.....	329
Mechanics.....	731
Home Labour-Saving Devices.....	431
Model Kitchen, The.....	748
Production of Vegetable Seeds, The.....	127
Root Seed Production.....	894
Sale of Pure-Bred Live Stock.....	997
School Fairs in the District of Bedford.....	141
for 1916.....	456
Selection and Equipment of District Representatives' Offices, The.....	241
Short Courses.....	317
in Household Science.....	318
Teaching of Science, The.....	468
Ventilation of Poultry Houses, The.....	709

ONTARIO.

Acre Profit Competitions in 1915.....	141
Advertising Canadian Fruit.....	729
Agriculture in Ontario.....	799
Agricultural Legislation.....	552
Agricultural School for Eastern Ontario, An.....	899
Agricultural High Schools.....	1002
Beautification of School Grounds, The.....	274
Bee-Keeping, Spring Report on.....	565
Boards of Agriculture.....	439
Cheese Factory and Creamery Instruction and Inspection.....	976
Crop Production in 1915.....	35

Dairy School, Ontario Agricultural College.....	47
Eastern Ontario, Kingston.....	50
Demonstration—Lecture Courses for Women's Institutes.....	264
District Representatives, Notes from.....	43, 147, 443, 561, 740
District Representative Leaflet.....	45
District Representatives' Conference.....	903
Drainage Work for 1916.....	441
Duff, the Late Honourable, J. S., Minister of Agriculture.....	1089
Education in Agriculture at Toronto Exhibition.....	905
Encouragement to Sheep Raising.....	998
Experiment in Orchardring, An.....	900
Farm Labour.....	246
Farm Mechanics.....	732
Feeding Hogs for Profit Competition.....	145
Girl Guides, The.....	746
Grants to Live Stock and Poultry Organizations.....	548
Hill Selection of Seed Potatoes, The.....	901
Home School Gardens.....	643
Industrial Farm System, The.....	341
Inspection of Nursery Stock, The.....	1084
Lime as a Fertilizer.....	334
Live Stock. Judging Competition, Inter-County.....	45
Short Courses, 1915-16.....	442
Motor Car in District Representative Work, The..	988
Potato War Plot Fund, Children's.....	564
Physics Building, O.A.C., Guelph, New.....	261
Production of Mangel Seed, The.....	808
Rural Highways.....	533
Rural Life Conferences.....	836
School Fairs.....	81, 629
School Gardens.....	160
School Garden Plans for 1916.....	357
Seed Fairs.....	720
Selection and Equipment of District Representatives' Offices, The..	241
Sewage Disposal in Rural Districts.....	840
Short Courses, 1915-16, Live Stock.....	442
In Apiculture.....	146
Successor to Prof. J. B. Reynolds.....	822
Summer Schools for Teachers.....	570, 929
Sweet Clover.....	130
As a Honey Plant.....	132
Teaching of Household Science, The.....	1094, 1097
Training of Teachers for Agricultural Instruction, The..	920
Ventilation of Live Stock Buildings, The.....	618
Weed Control.....	249
Women's Institute Meetings, Summer Series of.....	443

MANITOBA.

Agriculture in Manitoba.....	870
Agricultural College Appointments.....	1000
" High Schools.....	1003
" Legislation.....	554
Alfalfa Hybridization.....	445
Alfalfa Seed Production and Inoculation.....	338
Beautification of School Grounds, The.....	275
Boys' and Girls' Clubs.....	826
Cheese Factory and Creamery Instruction and Inspection.....	980
Co-operative Fattening of Farm Chickens.....	823
Co-operative Marketing of Wool.....	352
Consolidation of Rural Schools, The.....	362
Crop Production in 1915.....	37
Crusade Against Weeds, The.....	827
Elementary Agricultural Instruction—A Review and Forecast.....	68
Exporting Feeders and Stockers.....	999
Farm Drainage.....	330
Farm Labour Supply.....	351

	Page
Farm Mechanics	734
Grants to Live Stock and Poultry Organizations	549
Hill Selection of Seed Potatoes, The	810
Home Economics' Societies, The	352
Home Labour-Saving Devices	432
Home School Gardens	644
Lime as a Fertilizer	335
Notes	150, 447, 566, 633
Pasture Crops in the Prairie Provinces	419
Ploughing Match Rules	827
Poultry Market Situation, The	998
Production of Field Root Seed, The	129
Production of Vegetable Seeds, The	128
Road Drag Competitions	542
Rural Highways	538
School Fairs	84
For 1916	457
School Gardens	161
School Garden Plans for 1916	357
Seed Fairs and Poultry Shows	149
Seed Grain Fairs	825
Sewage Disposal in Rural Districts	841
Short Courses	319
Short Courses for Rural Ministers	837
Summer Schools for Teachers	571
Teaching of Household Science, The	1099
Training of Teachers for Agricultural Instruction, The	921
Value of Farm Production in 1915, The	234
Ventilation of Poultry Houses, The	712

SASKATCHEWAN.

Activities of the Department of Agriculture	1000
Agriculture in Saskatchewan	700
Agricultural Legislation	557
Alfalfa Seed Production and Inoculation	339
Beautification of School Grounds, The	277
Better Farming Train, The	828, 909
Better School Days	839
Boys' and Girls' Contests	1005
Butter to England, Exporting	1091
Cheese Factory and Creamery Instruction and Inspection.	981
Co-operative Marketing and Shipping	354
Co-operative Marketing of Wool	884
Co-operative Poultry Marketing Stations	907
Consolidation of Rural Schools, The	365
Creelman, S. D. No. 998	1004
Crop Production in 1915	39
Dairy Instruction Car	449
Dairying Lecture Train, A	156
Dairymen's Association	97
Deputy Minister Mantle killed in action.	1000
Dry Farming Congress	1091
Educational Exhibits at Fall Fairs.	813
Elementary Agricultural Instruction—A Review and Forecast	70
Farm Boys' Camp	57, 828
Farm Labour	246
Farm Mechanics	737
Grants To Live Stock and Poultry Organizations	549
Hail Insurance, Additional	829
Home Labour-Saving Devices	432
Home School Gardens	645, 646
Legislation Governing Cream Buying Stations	635
Lime as a Fertilizer	335
Live Stock Distribution	154
Convention	934
Model Kitchen, The	752

	Page
Noxious Weeds.....	449
Motor Car in District Representative Work, The.....	991
Pasture Crops in the Prairie Provinces.....	424
Patriotic Acre Scheme, The.....	267
Potato Planter, A.....	353
Potato Selection Work at Saskatoon	907
Poultry Marketing.....	156
Prairie Fowl, Protection of.....	1090
Regina Exhibition, The.....	830
Road Drag Competitions.....	544
Royal Commission on Live Stock, The.....	154
Rural Education Associations.....	462
Rural Highways	540
Rural School with Ten-Acre Grounds, A.....	763, 1004
Rural School, The, Ideal.....	764
School Fairs	85
For 1916.....	458
School Garden Organization, A.....	459
School Gardens.....	163
School Garden Plans for 1916.....	358
Seed Fairs	724
Selection and Equipment of District Representatives' Offices..	244
Sequence of Annual Crops at Saskatoon.....	152
Sewage Disposal in Rural Districts.....	841
Short Course at Weyburn.....	323
Short Courses.....	322
Soil Moisture Tests.....	156
Summer Schools for Teachers.....	571, 932
Sweet Clover	132
Swine, Contest in the Raising and Feeding of	268
Teaching of Household Science, The.....	1100, 1102
Training of Teachers for Agricultural Instruction, The.....	922
Value of Farm Production in 1915, The.....	234
Ventilation of Live Stock Buildings, The.....	619
Weed Control.....	250
Work of Co-Operative Associations.....	634

ALBERTA.

Agriculture in Alberta	1061
Agricultural Legislation.....	558
Better Farming Train.....	568
Cheese Factory and Creamery Inspection and Instruction	983
Co-operative Marketing of Wool.....	884
Crop Production in 1915.....	40
Educational Exhibits at Fall Fairs.....	814
Elementary Agricultural Instruction—A Review and Forecast	73
Extension Work	635
Farm Labour.....	247
Mechanics.....	738
Grants to Live Stock and Poultry Organizations	550
Industrial Farm System, The.....	344
Rural Highways.....	542, 636
School Fairs.....	87
School Gardens	169
Seed Fairs.....	725
Short Course Schools	450
Summer Schools for Teachers.....	571
Sweet Clover.....	135
Teaching of Household Science, The	1102
Training of Teachers for Agricultural Instruction, The.....	922
Value of Farm Production in 1915, The.....	235
Weed Control.....	251
Weed Inspectors at Claresholm, Convention of.....	746

BRITISH COLUMBIA.

	Page
Advertising Canadian Fruit.....	730
Agriculture in British Columbia.....	1071
High Schools.....	1105
Agricultural Legislation.....	831
Agricultural Credit.....	1092
Beautification of School Grounds, The.....	278
Boys' and Girls' Clubs or Junior Farmers' Institutes.....	157
Cheese Factory and Creamery Instruction and Inspection.....	984
Consolidation of Rural Schools, The.....	366
Cow-Testing Work.....	913
Crop Production in 1915.....	42
Egg-Laying Contest at Victoria, Fifth International.....	1092
Elementary Agricultural Instruction—A Review and Forecast.....	74
Field Root Seed Production.....	808
Foul Brood Inspection.....	453
Fruit Packing School at Duncan.....	157
Hill Selection of Seed Potatoes, The.....	810
Home Labour-Saving Devices.....	433
Inspection of Fruit Pests.....	452
Nursery Stock, The.....	1085
Model Kitchen, The.....	757
Minister of Agriculture, The New.....	830
Publications Branch Formed, A.....	451
Registered Seed Distribution.....	58
Rural Highways.....	542, 747
School Fairs.....	88
Gardens.....	175
Garden Plan for 1916.....	359
Seed Fairs.....	726
Training of Teachers for Agricultural Instruction, The.....	923
University Agricultural Work, Notes on The.....	831
Weed Control.....	253
Women's Institute Conferences.....	452

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